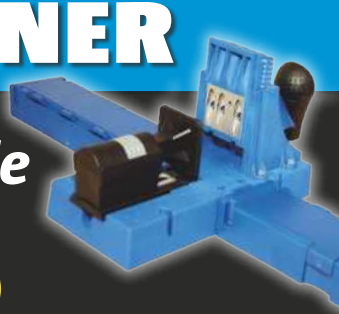
HOLE IN 1

KREG'S ONTO A WINNER



Why K5 pocket hole jig is 5-star player

Issue 290 £3.95

Good Woodworking

The No.1 magazine for aspiring designer makers

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BIG PROJECT

How to make sash windows

JIG FOCUS

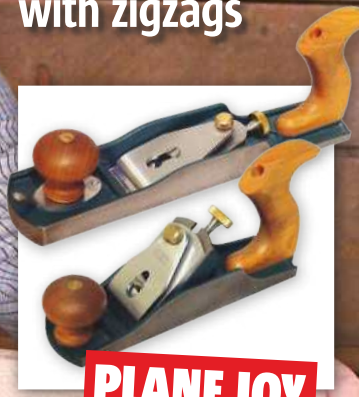
Leigh jointer just got even better

A&C CAB

Corner piece in Ercol style

USING CNC

Ed experiments with zigzags



PLANE JOY

Why Andy loves 2 from Kunz

GW ON THE ROAD

EAGER BEAVERS

chase the Mouseman

PLUS...

- Around the House: how Phil Davy hid his meter
- Turning: Les Thorne creates two tea-light holders
- Foundations: Michael Huntley cuts haunched M&Ts

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Welcome

I've just returned from *GW's* annual busman's holiday, this time with *WW's* Mark Cass in charge of the camera, on a road trip around North Yorkshire – yes, he'll be brewing up in the souvenir mug – which introduced us to young makers in York, a talented saw maker in Scarborough, about which more in future issues, and the Thirsk Furniture Trail, **p56**. Yes, it was a hard two days on your behalves, braving blizzards, exchanging a few cross words involving the efficiency or not of satnavs over maps but, thanks to handfuls of Haribos and a desire to finish the job, we did it. But isn't having to solve a few obstacles what makes woodworking so constantly rewarding? Take Hannah Dowding for instance, **p64**; when we threw her the googly of making her usual table in green wood instead of well-seasoned timber she rose to the challenge superbly. Look at the design of Imogen's table, **p42**, and you can see what Edward Hopkins had to overcome. If sash windows sound frightening, then fear no more as Mike Jordan explains the process, **p36**. To ease the load, Andy King reports on a couple of great jigs, **p15**, and praises Kunz planes, **p20**. Get too it!

Andrea Hargreaves, Editor

Andrea Hargreaves
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Technical Editor

Dave Roberts
Consultant Editor

Phil Davy
Consultant Editor

We endeavour to ensure all techniques shown in Good Woodworking *are safe, but take no responsibility for readers' actions. Take care when woodworking and always use guards, goggles, masks, hold-down devices and ear protection, and above all, plenty of common sense. Do remember to enjoy yourself, though.*

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Good Woodworking

March 2015

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Yorkshire road trip
The first stage of Andrea Hargreaves' sojourn takes her on the trail of Thirsk's furniture makers where she finds all sorts of critters

Cover photograph by Mark Cass

The BIG project!

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Techniques

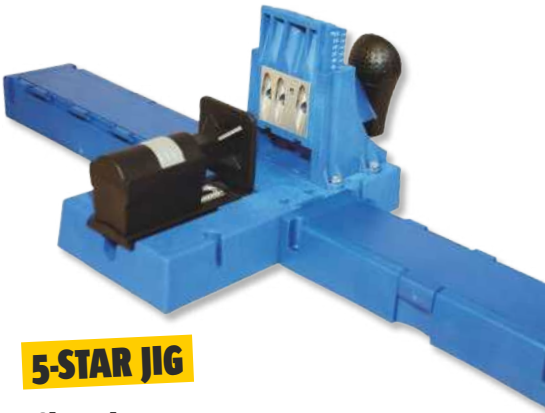
People & places

Your favourites

Good Woodworking

Andy King tests...

Phil Davy tests...



5-STAR JIG

Like the Kreg K4?

Then you'll certainly love the ingenious K5!

BRING ON THE MACHINE!

GW 291 ON SALE 27 MARCH

Edward Hopkins cut out zigzags on a CNC router **42**

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Tea-light holders...

...turn them as plain or fancy as you like **80**

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CON300	230X115mm	330w	£29.98	£35.98
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Tiger 11/250	2.5Hp	9.5	24ltr	£119.98	£143.98
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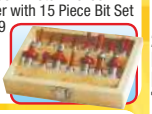
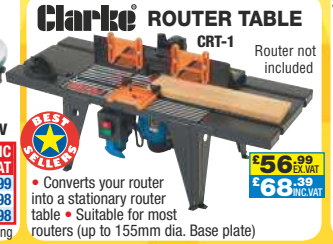


Clarke ROUTER TABLE CRT-1

Router not included



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With sanding belt

MODEL	DUTY	WHEEL DIA.	EX VAT	INC VAT
CBG6RP	DIY	150mm	£27.99	£33.59
CBG6RZ	PRO	150mm	£37.99	£45.59
CBG6RSC	HD	150mm	£47.99	£57.59
CBG6SB#	PRO	150mm	£49.98	£59.98
CBG6RWC	HD	150mm	£54.99	£65.99
CBG8W (wet)	HD	150/200mm	£55.99	£67.19

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MODEL	MAX DEPTH CUT 45°	90°	TABLE SIZE (mm)	EXC. VAT	INC. VAT
FURY5*	54mm	73mm	625x444	£149.98	£179.98
RAGE5‡	55mm	79mm	868x444	£269.00	£322.80

*FURY power: 1500w (110V available)
‡RAGE power: 1800w/230V (110V available)
table extensions included
* was £191.98 inc.VAT ‡ was £334.80 inc.VAT

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11.8kW

6.9kW

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- Great range of DIY and professional saws
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*Includes laser guide

MODEL	MOTOR	MAX CUT 90/45 (mm)	EXC.VAT	INC.VAT
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Clarke CC52	1300W	60/45	£59.98	£71.98
Clarke CON185*	1600W	60/40	£59.98	£71.98

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- Large storage draw
- Sunken tool trough
- LxWxH 1520x620x855mm

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News from the bench

Comment, insight, views and news of woodworkers from around the globe

Dremel powers into new year

Dremel 8200-20 multitool

Dremel has increased the runtime on its 8200 cordless multitool along with faster charging. It now boasts a 2.0Ah 10.8V Li-ion battery, a high-power 36mm electric motor, a slide speed switch providing full variable-speed control up to 30,000rpm, a motor brake to ensure that the accessory on the tool stops spinning immediately after switching off, a 3-LED battery gauge, a separate on/off switch with collet lock-out function to ensure no accidental actuation of the collet lock, EZ Twist for tool-less accessory change and a soft grip.

The kit, costing £145 inc VAT, contains the multitool, two batteries, a 30-minute charger, 20 cutting, grinding, sanding, polishing, accessories including the EZ SpeedClic, all packed into a soft bag.

DSM compact saw set

Dremel is offering a £30 saving on its new DSM20 compact saw cutting set which comprises seven accessories: a SM500 multi-purpose carbide cutting disc, two SM510 metal and plastic cutting wheels, two SM520 masonry cutting wheels, a SM540 diamond abrasive wheel and an SM600 multipurpose carbide flush-cut blade for cutting through soft wood, hardwood, plywood, laminate, plastic, tile, drywall/plasterboard, copper, cast iron, aluminium, soft metals, marble and brick. The wheels allow users to perform a diverse range of cutting applications e.g. straight, flush and plunge cuts. The wheels are being offered in kit form for £45 inc VAT.

Router bit set

This new set contains all seven of Dremel's router bits. Offering a saving of £40, the kit is offered in a wooden box for just £34.99 inc VAT instead of £75 if these items were bought individually.

Festool Unplugged

The launch of Festool Unplugged sees the brand develop its cordless offering featuring a combination of 5.2Ah battery packs with brushless EC-TEC motors for optimal power usage, efficiency and longer tool life, and PowerSelect, offering more tool and battery combo flexibility. "With our cordless range, we are focusing on increased intelligence, increased efficiency, and longer tool life," explains Festool product manager Patrick Haußmann." To this end, Festool is focusing on the intelligent interplay between its tried-and-

tested brushless EC-TEC motor technology and the latest cell technologies. "Our battery packs and tools have all been compatible for years. This even applies across systems for older battery packs with NiCd and NiMH cells, which can be used in current-generation Li-ion tools."

PowerSelect

The new PowerSelect offers three different buying variants. The Basic version includes the cordless tool without battery packs or charger but it still comes in a Systainer and with core accessories. The Plus includes the cordless tool, Systainer and core accessories and comes with the battery packs and charger. The Set version offers the same as the Plus but with added extras and accessories.

The 3-year Service all-inclusive guarantee now also applies to battery packs and chargers.

For more info go to www.festool.co.uk/unplugged; all information about Service all-inclusive is available at www.festool.co.uk/service

Irwin Impact

The new Irwin Impact range is primarily for screwdriving and it includes the launch of Impact single and double-ended bits, quick-change extensions and a right-angle drill. There are also 10 differently configured Pocket and Pro moulded resin set cases. Unlike many screwdriver bits on the market, Irwin's Impact accessories are engineered specifically for use in impact tools.

The single- and double-ended bits are manufactured from heavy-duty, high-grade steel to deliver superior fitment, reduced strip and cam-out, and are able to withstand high torque outputs. The double-enders feature DoubleLok Technology, which locks both ends of the bit into impact drivers and quick-change chucks.

They are compatible with the new magnetic screw-hold attachment whose rare-earth magnet is four times more powerful than a standard magnet.

The right-angle drill features a low-profile attachment, steel gear and ball-bearing drive, and a metal housing.

For more info visit www.irwin.co.uk

Tradesman Day competition

Irwin Tools is giving tradesmen the chance to win a brand new Ford F150 4 x 4 as well as a truckload of Irwin tools and tickets to top sporting events. Now in its 5th year, National Tradesman Day 2015 will be on 18 September and celebrates exceptional individuals who go above and beyond to achieve the best results and make a positive impact within the industry. To nominate a tradesman who you think is worthy of the 2015 Ultimate Tradesman title visit www.irwin.co.uk/nominate

RTJ400 on test

Turn to page 16 to see how Andy King got on with Leigh's new jig, the RTJ400, designed specifically for router table use. The template is precision CNC machined from aircraft-grade aluminium and will make nine sizes of through dovetails, three sizes of half-blind dovetails and four sizes of box joints.

Leigh at Axminster

Axminster Tools & Machinery has just completed a deal which will give the company exclusive rights to sell the Canadian Leigh jigs throughout the UK and Ireland. The Leigh range includes the award-winning D4R Pro, Super Jigs and the new RTJ400 Dovetail Jig. All come with a 5-year warranty.

President of Leigh Industries Matt Grisley commented: "Making and distributing the world's best router joinery jigs requires commitment, dedication and direct communication with end users. Axminster Tools & Machinery has been providing this to its customers in the UK for over 40 years, and we at Leigh look forward

to a long and mutually beneficial partnership with them. To be able to have a personal demonstration of Leigh in every store is the perfect way to see why Leigh is number one worldwide."

A demonstration of these machines can be arranged at any Axminster store. Staff have been trained to show just how easy it is to create perfect dovetails. There is also the opportunity for customers to have their routers set up for free when they purchase a Leigh jig. For more information about this and to book in advance, customers are asked to contact their nearest store.

Axminster also offers a 1-day introductory course to Leigh Jigs in its Skill Centres in Axminster and Sittingbourne, see photo above. Dates and further details about the course can be found at axminsterskillcentre.co.uk

For more information about Leigh products and to find your nearest Axminster store, visit axminster.co.uk

Hobby series spindle oscillator

Axminster's oscillating bobbin sander is designed for home use. It oscillates by 24mm, spreading the wear over more of the sanding sleeve. The cast-iron table tilts up to 45° and has several nylon table inserts to give a close fit around the bobbin. The 370W induction motor is quiet and slow running so as not to burn your work. The base is fabricated in sheet steel and has storage for spare bobbins and table inserts. Dust extraction is via a 50mm port on the rear and should be connected to a suitable vacuum extractor. Supplied with 19mm, 38mm, 50mm and 76mm bobbins, it costs £299.96 inc VAT.

Triton T20 powers on

The Triton T20 range delivers three professional drilling and driving options from a Li-ion power pack system, maximising its performance through a precision- engineered gear box. Thirty-minute recharging to 80% capacity and electronic control enable the power-matched Mabuchi motors and sintered steel metal gears to deliver speed and torque.

The range consists of a multi-speed drill driver, combi drill driver with hammer action, and a high-performance impact driver that delivers 160Nm of sustained torque and 3300 impacts per minute. All three also feature an over-moulded grip made from natural rubber compounds and LED worklight.

The T20 drill driver, impact driver and combi hammer each with two 4Ah batteries and an intelligent charger are available now at £220.17, £231.8 and £226.18 all inc VAT respectively. In addition a twin pack featuring the combi hammer and impact driver with two 4Ah batteries and an intelligent charger is available for £300.87. For more information log on to tritontools.com

Two more for Toolstation

Toolstation has opened two new branches in the Greater London areas of Sydenham and Isleworth (pictured), creating seven new local jobs in each branch.

The Sydenham store is located at Unit 5, Trade City, Spine Road, London, SE26 4PU and the Isleworth store at Unit 8, Clock Tower Industrial Estate, London, TW7 6GF. Both branches offer brands such as Makita, Stanley, Milwaukee and Crown Paints. All branches are open seven days a week. Orders placed at home or on site by 6pm Monday to Saturday can be delivered to UK addresses next business day, with free delivery on orders over £10.

COURSE**DIARY**

Think March, think extremes of weather, think hares, think of mad schemes that could be the sanest things you ever do – sign up for one of these courses!

March
1-6 Continuous arm Windsor chair
6-8 Furniture remake workshop
8-11 Hand-cut marquetry
12-15 Apprentice's stool
22-27 Dovetailed cabinet & drawer
West Dean College
West Dean
Nr Chichester
West Sussex PO18 0QZ
Tel: 01243 811301

4 Pen making (Axminster)
5 Fruit making with wooden chucks (Axminster)
5-6 Beginner routing (Axminster)
11-12 Beginner woodturning (Sittingbourne)
24 Taster session (Axminster)
31 Turning pestle & mortar (Sittingbourne)
Axminster Tool Centre
Unit 10 Weycroft Avenue
Axminster
Devon EX13 5PH
Tel: 0800 975 1905

16-20 Double bow Windsor chair
The Windsor Workshop
Churchfield Farm
West Chiltington
Pulborough
West Sussex RH20 2JW
Tel: 01798 815925

21 & 28 French polishing and refinishing
Peter Sefton Furniture School
The Threshing Barn
Welland Road
Upton upon Severn
Worcestershire
WR8 0SN

April
8-9 Beginner routing (Sittingbourne)
10 Pyrography (Axminster)
15 Sharpening with Tormek (Sittingbourne)
21 Fine-tuning handtools (Sittingbourne)
23-24 Beginner woodturning (Sittingbourne)
Axminster Tool Centre
Unit 10 Weycroft Avenue
Axminster
Devon EX13 5PH
Tel: 0800 975 1905

13-17 Beginners' furniture making
20-24 Advanced furniture making
27-28 Routing intro/tool tray
Peter Sefton Furniture School
The Threshing Barn
Welland Road
Upton upon Severn
Worcestershire
WR8 0SN

Charity uses woodwork for clients

Nestled in a quiet corner of the historic Scadbury Park Nature Reserve in the London borough of Bromley is a project with woodwork and wood recycling at its heart.

Shaw Trust is a national charity that supports people who face disadvantage to gain skills, find work and take control of their futures. Suzanne Parsfield is one such person. Suzanne has Tourette's, obsessive compulsive disorder and Asperger's, all of which make it more of a challenge for her to communicate with others. Since enrolling on the project, she has progressed onto a paid placement, giving her experience and enhancing her CV for when she is ready to move on and find paid, long-term employment.

The project specialises in collecting wood waste, grading it, and then selling or using it to make small wood items such as shelving and furniture. Clients supported by the project, like Suzanne, are given the opportunity to learn new skills and gain accredited training which will support them in their future careers.

The tasks undertaken by clients include basic manual handling and segregating waste timber into re-usable materials suitable for recycling. Waste timber is also prepared so that it can be re-used in the project's workshop where clients are taught basic carpentry and the manufacturing of small wood products, which can then be sold in Shaw Trust's charity shops around the UK.

Over the last 18 months, 45 clients have gained skills and experience at the project. Of those who have started, 96% have completed their placement and well over half have now found employment. With six other Shaw Trust woodworking projects offering the same support in different parts of the country, as well as other related options, such as retail and horticultural projects, they are building a creative network of enterprises that help clients as well as raise funds.

Suzanne Parsfield at work at the Shaw Trust

Suzanne says: "The best part of my day is seeing how the odd bits of wood are made into things we can sell. Items you wouldn't imagine; from tables and garden chairs, to bird boxes and candle holders. We are all given a chance to think of new ideas. I get the opportunity to use tools I would never have used before and training which leads to a qualification."

For more info visit www.shaw-trust.org.uk

Philip Dobbins goes Deco

Philip Dobbins, part of the Northern Contemporary Furniture Makers group, has produced a stunning cabinet-on-stand as an exhibition piece. With Art Deco influences, it relates to collectors' cabinets. It is in European burr walnut with all four sides of the piece displaying book-matched panels, and is enhanced by boxwood accents like its delicate sabot feet. The sweeping ogee-moulded top to the stand is reflected by the cove-moulded top detail. The bespoke door handles are in bronze with inset peridot gemstones. The three inner drawers are lined in oak and there is a concealed drawer in the stand. The interior, lined in carefully matched walnut, is discretely lit with LED lighting.

Philip Dobbins' drinks cabinet

Dovetailors stools

Dovetailors has launched a range of limited edition stools and bar stools, the first in a new series of designs that will form part of the furniture makers' retail collection. Creative director David Wilson says: "This year will see us expand the retail side of the business to run alongside our successful bespoke furniture-making operations. We have an exciting collection of designs and we are looking forward to unveiling them to the public in the year ahead." The stools, finished in oil, come in two heights with a light maple seat contrasting against dark oak or walnut legs. They are available to buy in the Dovetailors design store at Sunny Bank Mills in Leeds or online at the Dovetailors store on Etsy: www.etsy.com/uk/shop/Dovetailors for £390..

Midlands show...

The tremendous line-up of demonstrators for the 'Midlands' Woodworking & Power Tool show includes Andrew Hall, Jennie Starbuck, Tony Wilson, Reg Slack, Wayne Mack, Michael Painter, Mick Hanbury, Colin Hickman, Mark Raby, Nic Westermann, Peter Tree, Bob Neill and Peter Sefton.

The 'Midlands' show, which takes place at the Newark Showground, Nottingham on Friday 27 and Saturday 28 March, promises an excellent day out with more than 50 trade stands and a tremendous line-up of demonstrators.

For further information telephone 01474 536535 or visit the show website at www.nelton.co.uk

...and Yandles too

Down in the West Country at Martock Yandles & Sons have secured Mick Hanbury, Tracey Owen and Mary Ashton among the turners at its show on Friday 10 and Saturday 11 April. They will be demonstrating alongside Rod Page and, new to Yandles, Keith Fenton. Gary Orange will be demonstrating chainsaw carving, Loxtonwood Craft will be showing their side axe and adze planking skills, Lyme Regis boat builders will be providing an insight into their techniques and the Japanese Tool Group will once again be demonstrating along with guitar-maker Ben Crowe. As always, there will be stick making, marquetry, carving – see new to Yandles Sarah Goss – plus furniture restoration and chair making alongside the displays that Exeter Woodcarvers, West Country Wood Carvers and Martock Wood Turners put on.

The twice-yearly show takes place in a sawmill founded more than 150 years ago and attracts top manufacturers like Record Power, Brimarc, Sorby and Triton, which will be offering special show prices.

Timber from Yandles' Self-Selection Centre will be discounted, there will be lots of show bargains, a sale in the Hobby shop, plus demonstrations, a refreshment marquee and the 303 Gallery to look around. Entry and parking are free. For more info go to wwwyandles.co.uk

Good Woodworking Free Reader Ads

Machinery

Multico Super Shop 5 in 1 woodworking centre, table saw, vertical drill press, horizontal borer, woodturning lathe, 12in dia sander disc, includes mortising attachment with ½in chisel, retractable castors, TCT saw blade, £350
Mr G Russell, Cambridgeshire ✆ 01945 780089

Sedgewick 571 hollow chisel mortiser, lightly used, £650; Woodrat WR900, first-class condition, cutters, dust control, full instructions, £250
Oxford ✆ 01865 858241

Multico 9in surface planer, new motor, Multico 10in circular saw, new motor, both single phase, £400; two 3-phase motors (2.5 & 2.0 kW), floor switches and starter boxes to match, £90
D C Davies, Carmarthen, S Wales ✆ 07803 818957 after 4pm

DeWalt 678 planer, bought 2000, little used, 82mm cutter width, 25mm rebate, £60, buyer collects
TR Mills, Ayrshire ✆ 01294 673236

Bosch GTS10 table saw. 240V, £320
Ealing ✆ 020 8248 0335

Turning

Record No.3 36in centres + bench, £165; Record chuck system, Axminster various chucks, £130; turning tools, many, £90; wood blocks, large amount, £75; all as new, buyer collects
Mr J Thompson, Derbyshire ✆ 01246 863593

Record Power RP3000 power chuck, Coronet lathe No.2, any reasonable offers considered
Charles Carroll, Warrington ✆ 01925 267660

Wanted

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A. Barron, London ✆ 07711 059113, abarron@btconnect.com

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Good Woodworking

Kit & Tools

New products, tools and tests

Andy King, Technical Editor
andy.king@mytimemedia.com

Focus on Jigs

K5 STAR!

Only nine issues down the line from the great Kreg K4, the K5 swaggers into town

The K5 is a radical redesign of its predecessor, making it even more user friendly. It's footprint is bigger but clamping is now via the front side with a large paddle working in a cam-like fashion, hinged below the base to pull the clamping foot inwards to secure the work. Two side extensions support wider boards as well as offering flip-up lids for storing the drill bit, side stop and depth setting block for the drill and a few screws.

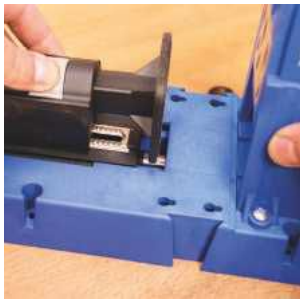
These extensions slot in with a dovetailed fitment and for a permanent setup there are appropriate fixing holes on the jig and the extensions.

The jig bushing block is now held with a spring-loaded pin rather than the threaded pin of the K4 so there's no danger of losing it. The clamping shoe slides on a ratcheting plate into notches that snug it up close to the workpiece when the clamping lever is engaged. Pushing on the large grey button releases the shoe from the plate so it can be slid back for thicker work. It's a brilliant improvement over the K4 and you can now swap in a flash between any thickness from 12mm to 38mm.

Instead of a slot for setting the drill collar there's now a stepped block. It works well enough, and helps eliminate mis-setting of the drill to the corresponding timber, but I still like the moulded-in version on the K4.

The high-quality drill has sharp flutes along its length for very clean holes and fast drilling, and with the dust port now a built in swivelling outlet, clogging is reduced.

▲ This large cam lever locks the work firmly in position



▲ The lever is linked to this ratcheting shoe, making it easy to alter settings

▲ The spring-loaded indexing pin is used alongside the height scale on the side that relates to timber thickness

▲ Once the guide block is at the right height, the drill can be set up with the stop collar

Conclusion

The K4 is great but the K5's fast adjusting capability makes life so much easier when working with different thicknesses.

Good Woodworking The Verdict

+ Fast adjustments; storage containers for bits; support for wider work
– Drill has to be set with a block

Rating ★★★★★
Typical price: £99.95
Min timber thickness: 12mm
Max timber thickness: 38mm
Web: www.kregtool.eu

Prices

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★★★	Performs well, but you will find better
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★★★★★	So good, even Andy would get his wallet out!

Leigh jig just gets cleverer

Focus on Jigs

When Andy heard that Leigh had come up with a new dovetail jig he went hotfoot to Axminster to give it a go

At 6ft 6 and built like a rugby player, Leigh Industries president Matt Grisley somehow personifies his innovative jointing machines. I had been invited to meet him at Axminster's Devon HQ. In fact I had met him more than ten years ago in the company of Brimarc MD Martin Brown and Phil Davy, and I was gratified that he remembered me.

This time around it was to show me a piece of kit that is so new it was still warm from the CNC machine. But before I move onto that I'll relate the chat I had with Matt about how Leigh came into being.

Martin Brown had filled me in with a detail or two prior to this meeting, but having known Martin for some 15 years, I thought he was winding me up as he said the name was down to Leigh on Sea!

Along with this, he said, the innovator and founder of the company, Matt's father and current chief executive, Ken Grisley, ran a car business there.

Turns out it's all true! Ken had decided it was time for pastures new and upped sticks to Canada with his wife and young family back in the 80s, doing various jobs around the Vancouver area while still continuing with his passion for woodwork.

It was the struggle to cut dovetails in a timely and consistent manner along with the difference from the standard halfblind dovetail jigs around that led Ken to thinking about a system to speed up the process while allowing a more elegant and adjustable style to the joints. From this Leigh Industries was born.

Despite its world renown, it's still a pretty close-knit company with only 15 people employed, including Matt's brother Steve who is the production & purchasing manager, and it seems to work well as the product is still hitting the same high standards and each is as unique as it is ingenious.

If you've seen a Leigh jig, you'll know it's all about diversity as well as simplicity, with basic through and half-blind dovetails a core process, with the more intriguing Isoloc joints such as the ubiquitous Bear's Ears allowing you to make your own mark on your projects.

So now it's time to see what new tricks are up the Leigh sleeves, and that brings me on to my exclusive first look at the RTJ400...

▲ These slide-in guides make it easy to cut any joint

...So what's new?

Leigh has long been at the forefront of high-end jigs for dovetailing, and aside from these unlimited options, their innovative possibilities have been put to much decorative work using

▲ The top frame locks to the comb with these latches

▲ Indexing shoes and slots along with etched lettering make it easy to set positions

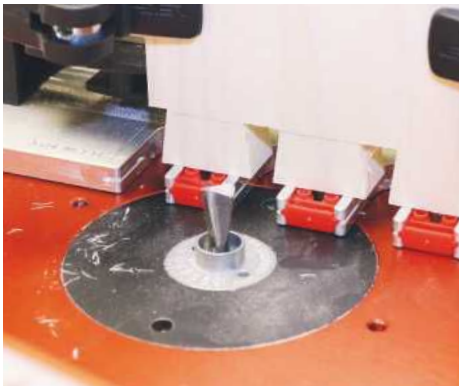
▲ Work locates against a side stop

▲ This small red peg sets the correct offset for comb joints

▲ The resulting joint is very clean and accurate

▲ Half-blind dovetails show the usual rounded profile when routed

▲ The red pegs slide into the comb for setting different tail spacings



▲ The pegs prevent the guide bush from making a cut

some of the more elaborate Isoloc jig templates.

My first impression was that I'd seen it before as it is used on the router table in an inverted fashion, much the same as the Gifkins, Keller and other variants of the fixed template that uses a matched set of dovetail and straight cutters to form the joint. But although a somewhat souped-up version compared to others, a closer look soon dispelled the similarities as there's a lot more than meets the eye. At its base level it does indeed make the standard through dovetails of the other systems, but unlike other fixed comb jigs out there, the Leigh allows you to move away from the equally spaced tails and pins that confine them, so you have the capability to introduce variety and different, almost hand-cut, features to your projects.

If you know the Leigh system, this one follows similar traits: easily adjusted cam clamps for securing the work, high-quality aluminium extrusions, and importantly on any jig, this one is very easy to get to grips with and, once mastered, pretty easy to go back to and pick up where you left off – well worth considering for that alone.

A neat channel in the top of the jig houses all the relevant info for each type of joint on slide-in strips, showing cutters, positions to cut the joint and so forth, acting as an idiot's guide to walk you through each step.

2-part system

So aside from the on-board guide, the jig's simplicity is built around the use of indexing pins and corresponding holes to attain repeat settings for joints with precision fit every time.

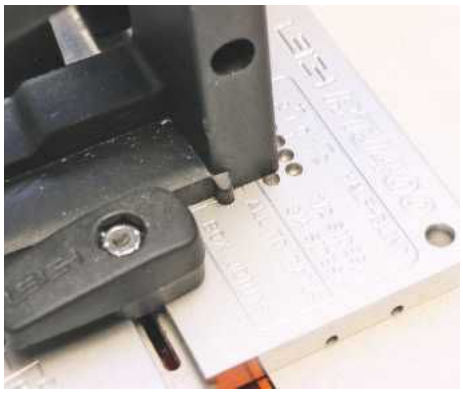
The jig is a 2-part system; the lower jig comb is connected to an upper frame with quick-release locking connectors.

By making one part of the joint with the jig in one set of indexing positions and then, according to the joint being cut, simply unlocking the top frame from the lower comb and either shunting it over to the next position or spinning the comb around and repositioning the top frame to the comb in the corresponding indexing position that marries up to the first part of the joint, the second part of the joint is cut using the appropriate cutters. And it really is a simple method as the positions are so clearly marked with etched lettering alongside the holes. It makes the initial setting and cutting of each particular joint a breeze, whether a through dovetail, half blind or fingerjoint.

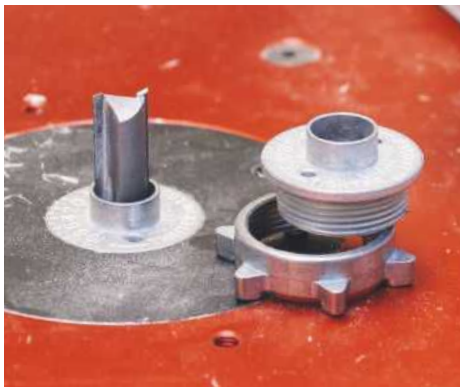
▲ It makes a finer pin profile on through dovetails

▲ This black rod slides into a channel on the jig

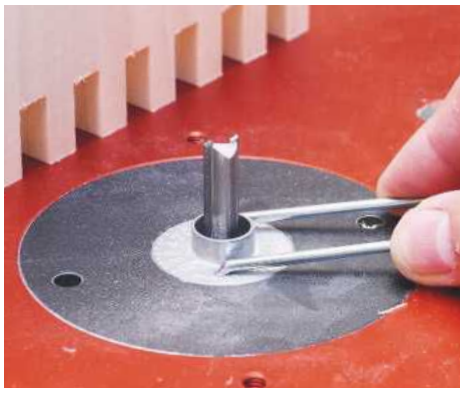
▲ It acts as a stop to limit the depth of cut on joints using thinner stock



▲ Each style of joint has a set of indexing marks



▲ The jig comes with the 2-part eBush



▲ By moving the guide bush in small increments the fit of the joint can be adjusted

▲ There are various cutters available to give more scope to your jointing

Optimum stock widths

However, despite its diversity, unlike the sliding pin and tail combs of the bigger Leigh jigs, the RT400 with its fixed template comb still has to work to stock of certain width tolerances to ensure the subsequent joints are machined correctly with pins and tails, or fingers in the case of box joints, in a balanced manner.

The maximum stock width is 406mm (16in) with tables showing the optimum stock widths for each joint and alongside this you can work stock as thin as 3mm up to 26mm depending on the particular joint you are looking to make.

With the jig set up to the correct indexing for any of the joints it can make it's still based around a uniform equally spaced tail and pin ratio but this is where the additional diversity of the RT400 comes into its own.

It comes with a nifty set of blocks that you slide into the comb spacings to prevent the router from cutting that particular area of the work and in doing so, giving your work a more traditional wider tail fine pin style or variations on the spacings to suit your own designs.

Conclusion

While I've only scratched the surface of what can be done with this jig, I'm very impressed by it; it really is the fastest and easiest jig to set up and has a lot of options within it without becoming complex and confusing no matter what you try.

Take heed of the tables that show the optimum stock dimensions to suit the joint spacings and it will be a jig that will make your jointing very fast and accurate while still allowing design parameters to be included for a traditional style as required. In a nutshell then, the jig delivers fast, easy and accurate jointing with diversity.

The Good Woodworking Verdict

+ Fast setup for any joint; plenty of jointing options

– Stock has to be specific widths

Rating ★★★★½

Typical price: £285
Max stock width: 406mm
Minimum thickness: 3mm
Max thickness: 26mm
Web: www.brimarc.com

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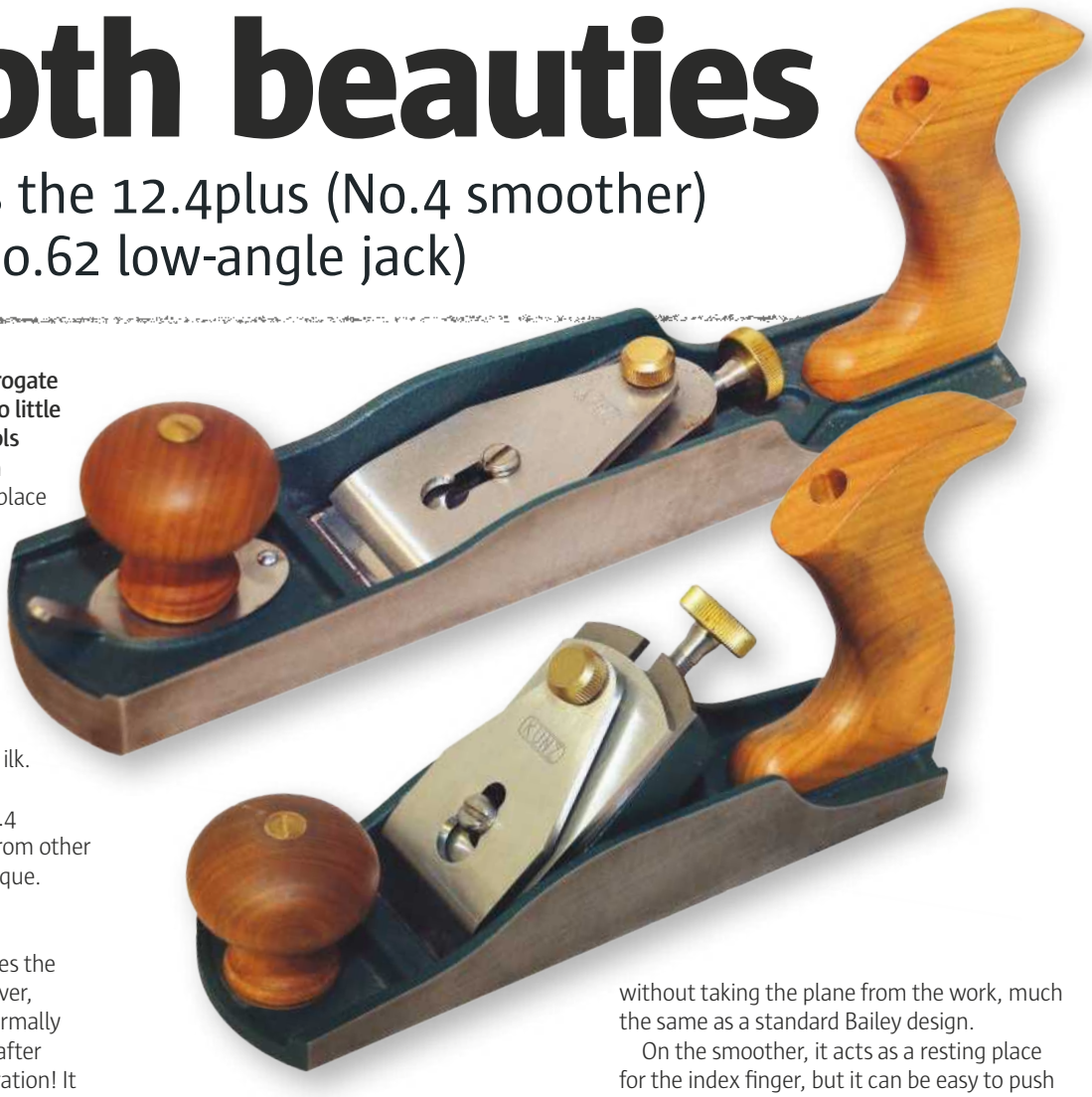
Smooth beauties

Andy discovers the 12.4plus (No.4 smoother) & 12.62plus (No.62 low-angle jack)



On my recent jaunt to the Harrogate show I came across these two little beauties on the Johnsons Tools stand. Kunz tools usually bear garish bright green and red to signify their place in the cheaper end of the market so it wasn't until I saw the engraved lever cap that I realised they were from the same company.

These are a massive step away from those lower-end planes, targeting makes like Lie Nielsen, Veritas and Clifton as well as the excellent Woodriver planes and their ilk.

And while the design of both the low-angled bevel-up jack and the No.4 smoother look to be little different from other premium planes, they are in fact unique.

Adjustments

First off, the lateral adjustment moves the blade in the same direction as the lever, opposite to the way lateral levers normally work. It takes some getting used to after spending a lifetime of opposing alteration! It works well though, and alongside the Norris-style adjuster for blade advance used on both planes, the action is very smooth.

There is some backlash when altering between retracting and advancing the blade, close to two full turns on both of them, but to be honest I've never lost any sleep over this; as long as the wheel runs freely to take up the slack, as these do, then it's a fraction of a second to do so. I was a tad frustrated however on finding that making alterations to the lateral adjuster immediately introduced almost a full turn of backlash that has to be taken up each time it's altered, but the overall performance of the plane makes up for small niggles.

In the same vein, I was initially pleased to find that both these adjusting wheels are within index finger reach as well, allowing me to make adjustments to the cut without having to remove the plane from the work and sight it down, something that the longer Norris style adjusters prevent you doing; but you need to find a sweet spot in tensioning the lever cap that allows the cutter to be advanced without inadvertently altering the lateral setting; get it right and you can make fine adjustments without taking the plane from the work, much the same as a standard Bailey design.

On the smoother, it acts as a resting place for the index finger, but it can be easy to push it across when you are planing heavily, so you might find a four-finger grip better.

Lever cap retention

A neat piece of innovation is the lever cap retention method used on both planes. The screw-down threaded knob that applies the pressure has been drilled out on its underside allowing it to sit over the location pin for the cutting iron, which has been extended in length on the low-angle plane; on the smoother a longer screw connects the cutting and cap irons.

▲ The double irons connect together with a screw through a slot

▲ A longer screw on the iron acts as a stud to connect to the lever cap screw

▲ The milling of the frog is very clean and finely done

The Kunz design gives it a very positive double retention to keep the cap firmly in position when any adjustments are made, without any restriction on the adjustments themselves.

The simpler design of the bevel-up low-angle plane eliminates any frog adjustment; the mouth aperture is controlled with a standard twist-lock front knob and cam lever.

The smoother, with its traditional bevel-down, 45° pitched frog, has a remodelled Bedrock design. Traditional Bedrocks utilise a 3-pin adjustment to set the mouth opening, but the Kunz requires just one adjustment; a hex key-adjusted central screw at the back of the frog controls the setting so it's a tad quicker than a standard Bedrock.

The position of this adjuster is tricky to get to with a standard hex wrench, but a longer ball head wrench makes it easier to access.

Crisp build quality

The planes are backed up with crisp build quality. The bodies are made from stress-relieved grey cast iron so you may have to be a tad more careful not to drop them, but the milling is fine, flat and square.

Equally fine is the large bedding area for the irons, and with 3.5mm-thick cutting irons, made from optimised tool steel hardened to 60-62, there's a solid fit to keep chatter down on harder and gnarly timbers.

The irons take a good edge with no need to spend hours working the backs as they are very flat, so it was seconds of prepping before I could get to work and see how they performed.

A rough board of wild-grained cherry was easily tamed with the LA jack, coping perfectly with the wild grain patterns within to leave a smooth glassy surface.

The smoother did an equally fine job on cherry as well as some ash with edges raised straight off my usual Trend diamond stone sharpening regime.

Conclusion

Overall, I'm pretty impressed by these planes; their unique features set them apart from their main rivals while still performing as well as them and will provide more choice when on the hunt for a higher-end tool that offers quality and performance with minimal fuss.

The backlash niggles when altering the lateral adjustment is a small negative against the overall smooth drive.

The Good Woodworking Verdict

+ Neat cap iron retention; excellent machining; fine castings

– Backlash when altering laterally

Rating ★★★★½

Typical prices: No.4 **£189.99**; No.62 **£228.99**
Irons: 3.5mm thick, hardened to 60-62Rc
Castings: stress-relieved grey iron
Web: www.johnsontools.co.uk

▲ A single hex adjuster moves the Bedrock-style frog

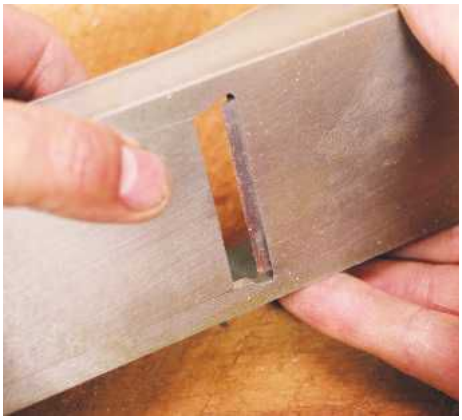
▲ Pushing the lever to the right or the left moves the blade the same way

▲ There's a natural index finger resting point on the smoother but take care not to move the lever

▲ A large milled bedding surface on the low-angle jack gives great support

▲ A stud projection on the Norris adjuster connects to the lever cap

▲ A simple cam adjuster alters the mouth opening



▲ The maximum opening is massive!

▲ But it also closes down to a hair for finer work

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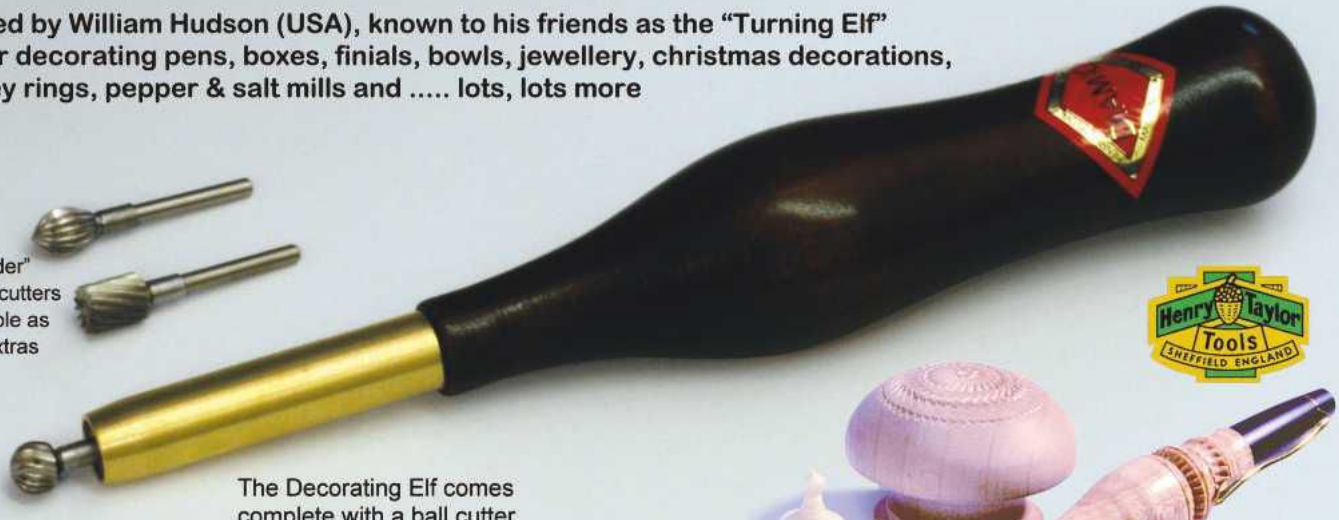

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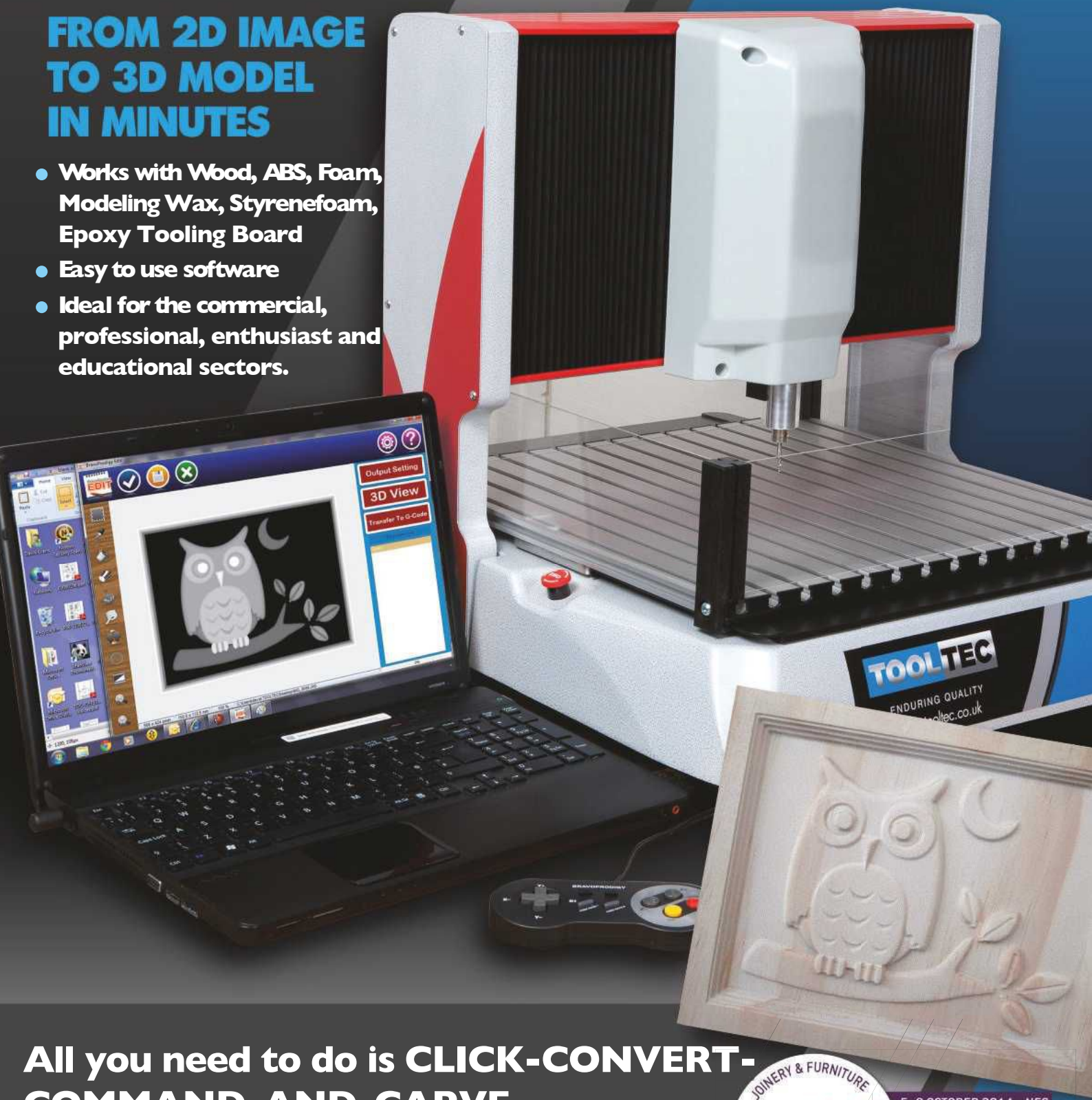

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Ammonia 'ere for the ideas

If I haven't done so before, then I freely admit to being one of those people who loves the idea of a thing, who enjoys the planning and preparation prior to doing or making it, and who begins a project with the best of intentions, but – as our own Andrea H will tell you – is easily distracted by the next idea that comes along. It makes for wonderful variety in life but a lot of loose ends which, periodically, I have to stop and ravel up. My workshop is no exception: I first mooted...

Dave Roberts, Consultant Editor

...the idea of painting and sealing the walls and floor, for example, back in October, but the 'impending reorganisation' of which I boasted in *GW*285 has only just begun. I spent a recent Sunday courting lung disease while brushing down the age-old distemper on the walls and preparing the brickwork for a wash of PVA – mixed in what's probably an overly robust solution of one part PVA to four parts water; one pundit suggested that 1:5 or even 1:10 would be sufficient – followed by a good daubing with matt emulsion; I've chosen 'white with a hint of sarcasm', a colour that's popular at my trade supplier. Once that's done, the Ronseal One Coat Concrete Sealer will get an outing on the floor and its merits finally reported.

Magnetic wood

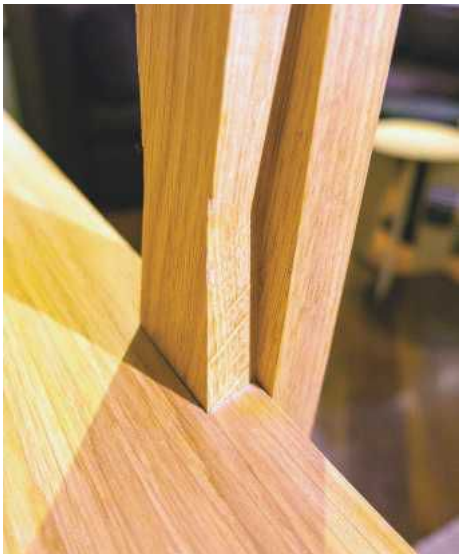
One of the spurs to this explosion of dust and activity was last month's visit to Mandie, Mark and Darcy in Arch 481, whose life under an East End viaduct – colourful and companionable though it is – reminded me that I should be grateful for the bit of rural outbuilding that my tools call home. And talking of tools, something else that I took away from Darcy's end of Arch 481 was his ingenious take on their storage. While my solutions in this regard are fairly conventional and pragmatic – shadow boards, salvaged drawers built into new cabinets, and the like – you obviously expect something more from the Caractacus Pott of Bow Common Lane. And you'll not be disappointed; just take a look at this contraption, see right!

He's used magnetic tool holders – widely available on the web for kitchen and workshop use – which he's bolted to a rotating, bearing-mounted hub that's suspended from a shelf above his workbench. The result is like something from the psychokiller school of interior design, and though the magnetic bars are pretty powerful – there's even a Stanley No.220 block plane hanging up, out of shot – it's not the sort of setup you'd want to spin too enthusiastically unless you're part of a knife-throwing act. On the other hand, it certainly makes for a space-saving way to keep your tools to hand, and is much less fussy in its organisation and use than a shadow board, so it's good food for storage solution thoughts. You'll see that he's even contrived to have 'magnetic wood' by letting in ferrous tabs to

Darcy's rotating tool racks rely on powerful magnets to avoid an industrial accident

Anyone for a dash of Roubo's 18th-century home brew...?

Making up for lost parts: a DIY escutcheon in the offing



Spotted in Copenhagen: an interesting application of the dovetail's mechanical strength

the handles of his marking gauges so they, too, can be hung from the racks.

Where there's brass...

...it turns out, on this occasion, that there's a fiddly solution in the offing. As one of my 'bluecollar restoration' projects reaches an end, I'm down to the details, refitting the hinges, locks and – bother! Where's that fourth escutcheon gone? Despite having carefully set aside all the cupboard's original hardware right down to the last screw and pin, I seem to have mislaid one of the escutcheons, which means I'm going to have to fabricate one.

The others all appear to have been stamped from brass, or something that has oxidised over the last 100 or so years so that it now resembles old brass. And because brass sheet is 1) easy to obtain, and 2) easy to work, I'm sticking to my identification. The plan, then, having now bought a small sheet of 0.5mm brass, is to paste a template – made by scanning and printing one of the originals – onto a section of it, and tin-snip, drill and file myself a new escutcheon. To age the replacement so that it – more or less – matches the others, I'll also need to experiment with patinating solutions.

Using ammonia is a simple method, though I understand that this only turns brass a lightish green-brown; for the deeper brown-black that I'm after I may have to resort to a proprietary ageing solution of the sort sold by, say, Tiranti in London (www.tiranti.co.uk). An alternative would be a recent discovery called Brass Black from Birchwood Casey, whose metal finishing products – including a bluing kit for steel and blacking for aluminium, for which you might find a creative use – can be found on Amazon or, indeed, at your local gunsmiths – which I'm sure should provide a neat segue via Bang & Olufsen to Denmark... erm, but time's against me so let us hasten away to Copenhagen without further ado.

Danish dovetails & dung

It was while on a quick trip to the magical kingdom of Tivoli – a country with a beautiful and famously crisp sense of design but, curiously no word for 'please' – that I spotted this shelving arrangement. As you can see, the back of the upright features a tapering dovetail that interlocks with the shelf, making the shelves themselves very quick to fit, but also very secure when under load, and the whole unit quite rigid – a huge improvement on those wobbly Habitat shelves of yore.

Continuing the theme, my impending patinating experiments remind me that Denmark is also home to woodworker Jonas Jensen, whose blog I tripped across the other day when reading up on methods of staining and fuming with ammonia. A year or so back, Jonas followed a recipe from AJ Roubo's C18th book T*o Make as Perfectly as Possible: Roubo on Marquetry*, in which the French maker describes, 'a least-costly method of dyeing white wood red.' Apparently, it goes like this:

"You take some horse dung, which you put in a bucket of which the bottom is pierced with many holes, and you place it above another bucket, into which falls the water from the dung, as it gradually rots. When it does not rot fast enough, you water it from time to time with some horse urine, which helps a lot and at the same time gives a red water, which not only stains the surface of the wood, but penetrates the interior 3 to 4 lines deep. In staining the wood with this dye, one must take care that all the pieces be of the same species, and about equal in density if one wishes that they be of equal colour throughout. This observation is general for all water-based stains... which requires the cabinetmaker to make a choice of wood of equal colour and a density as I mentioned before."

You can read about Jonas' experiments with Roubo's recipe for yourself at http://mulesaw.blogspot.co.uk/2013/09/the-horse-dung-experiment.html, but what interested me was that Jonas was unable to produce a properly red stain, though I've observed that, in my duties as chief undergroom here at home, the effect of neat, unfiltered horse stale is to turn the softwood woodshavings used for stable bedding a rather dramatic red. Authenticists and living historians out there, take note; and also NB the fact that Roubo's book has been reprinted by the Lost Art Press (www.lostartpress.com), a tiny US publisher that champions hand-tool skill, and whose books and DVDs are available in the UK from www.classichandtools.co.uk.

And here I am again, half a dozen ideas down the road but no further forward with painting the workshop...

Detective work

Finding the causes, location and nature of a stain will inform future decisions says **Stephen Simmons**

▲ Pic 1 **Think first: some stains may actually be natural figuring in the wood**

Stains are a common problem. Hot mugs, wet plant pots, juicy fruit and leaky pens are the usual culprits and, being on horizontal surfaces, the blemishes are all the more evident. Without getting into the realms of dodgy chemicals, proprietary stain removers and bleaches are your best option.

The manufacturer's instructions are there to be read, re-read and followed but you must bear three things in mind. Firstly, don't expect miracles. Their strength is limited and so, therefore, is their potential. You have to accept that they may not remove stains completely and that a 75% reduction, say, is as good as you may get. Secondly, there are unstated time implications. As they work directly on the stain rather than indirectly through any finish, it can be more effective to strip and treat the whole surface rather than just the area of the stain itself. You may then have to re-tint the whole surface after bleaching and before completely re-polishing. It's all extra work that you may not have bargained for or may not fancy.

Finally, unless you take trouble to identify the exact location, nature and possible causes of the stain at the outset, you can either tackle the wrong problem, make a mess or waste a lot of time. This aspect of the job is often neglected and I want to concentrate on it now because it will greatly increase your chances of success and satisfaction.

Use the light

The preliminary stages of most restoration projects involve detective work and stain identification is no exception. Instead of making assumptions start by looking at the problem from as many different angles as possible, with and against the light. If space doesn't permit you to walk all round your work, turn the work round to achieve the same effect. The important thing is to look at things critically rather than just seeing and accepting them.

Ask yourself a series of questions. Is the wood raw or finished? And if it is finished, with what? Is the surface dirty? Is the stain really where it appears to be? Has it penetrated the surface or is it just sitting on it? Is the stain light or dark? If dark, is it a burn rather than a stain? And is it greasy? Is it a solitary blemish or are there others? And is it a blemish at all...?

▲ Pic 2 **Light and dark: light marks in surface grime...**

This last question is not as daft as it might appear. Some figuring can be quite astounding with its blotches of colour and sudden changes of texture (**Pic.1**). To the novice it can look quite improbable and the assumption that some may be stains is not unreasonable. One of my clients was barely convinced that the flowering in the quartersawn oak of his 18th-century long-case clock was a characteristic of quality timber to be valued rather than a stain to be removed. Don't waste a lot of time trying to remove something that is a permanent feature of the wood.

Finish and grime

So, is the wood raw or finished, and if finished, with what? The finish is important because it determines the porosity of the surface and the extent to which a stain can penetrate the wood. It's rare for a surface to be completely untreated but soft finishes such as waxes offer little additional protection. So-called hard finishes such as varnishes and lacquers are much more robust and form a more efficient barrier. A stain that appears to be in the wood may actually be in the finish alone.

But that's not all. A good layer of grime can form a further barrier. The stain could be in neither the wood nor the finish but simply in the surface dirt. Don't neglect this possibility because it's surprising how many stains lie there and will come out with just a gentle clean. Some disappear completely and if not you may find that a big reduction is quite acceptable, in which case the job's done in a few minutes.

A good rule of thumb for locating the stain is whether it is light or dark. Light marks (**Pic.2**) are generally in the surface dirt or polish while dark ones are more likely to be in the wood

TIP Remember that some stains are quite acceptable as an integral aspect of patina.

▲ Pic 3 **...are easier to tackle than dark ones in the wood itself**

▲ Pic 4 **What lies on the surface gives no clue as to what lurks beneath**

itself, as a result of a chemical reaction with tannin, and often quite deep. Light marks are generally the easier to remove or reduce. You might have to strip off the finish and re-polish but you'll get an impressive result. Dark ones can be much more stubborn (**Pic.3**).

Dealing with stains

There are two exceptions to the light-dark rule. Ink will sit on top of a hard finish rather than penetrating it and this is seen in a good light. It can also feel a bit gritty. It's quite safe to try a bit of warm water applied with a cotton rag – a satisfying amount can come off straight away.

Other dark marks are burns rather than stains. They too feel gritty but more importantly there is often some wood loss when more than a minor singe on the surface is involved and they demand completely different treatment.

Grease also complicates matters. This is a two-part problem: the grease itself and the stain it creates. The test is to put a little water on the mark and if it forms into drops it's greasy. It has to be de-greased with Fuller's earth before any residual stain is tackled.

A solitary blemish may be straightforward to tackle but be wary of multiple stains. They can reflect years of abuse involving a cocktail of chemicals and reactions and some may be near impossible to remove. I've known invisible stains come to the surface after treating others and be not only permanent but far more unsightly than the original (**Pic.4**).

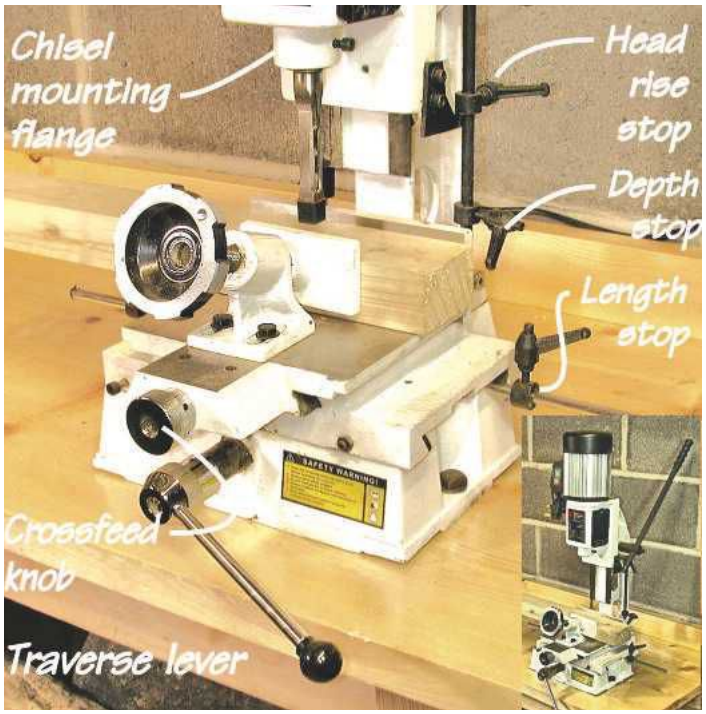
All this may sound complicated but don't fret. With a bit of practice you'll be able to make your preliminary survey if not at a glance then within a couple of minutes. Your most useful tool is the magnifying glass. You'll soon be able to locate the stain and to differentiate between types of blemish, particularly where ink and burns are involved, but it won't tell you how deep or stubborn a stain may be.

If you feel that stain removal is a lottery, one thing is certain – tackling the problem with an abrasive is a non-starter.

From hand to machine

Jeff Gorman

follows Michael Huntley's hand tool lesson last month with a trial run on a mortiser



◀ Pic.1 **The prospect of a Herculean amount of mortise chopping by hand led Jeff to decide it was about time he learnt how to use a mortising machine**

TIP

Safeguard fingers by carefully preserving the plastic end-protector supplied with the chisel – or mortise the end of a dowel to make one.

Over the years I've given quite a bit of time to thinking about mortising by hand (see *GW*15, 127, 129, 132, 204 and 205), and for my 2.2m wallbench (*GW*218 and 219) I would have contentedly chopped 24 12 x 65mm (15⁄32 x 2½in) mortises in the 70 x 70mm (2¾in) pine until the thought of other jobs in the pipeline forced me to convince myself that it was perhaps time I learned how to use a hollow-chisel bench mortising machine (Pic.1).

These pictures now show the mortise in its final resting place on the completed wallbench, but while bolting the machine into its temporary home and working without help I was glad that the weighty head assembly could be separated from the base. I found that I had to situate the machine to let the traverse lever swing clear of the bench's edge, and so as to avoid clashes with the cross-feed knob it was best for the lever to occupy one of the four available holes.

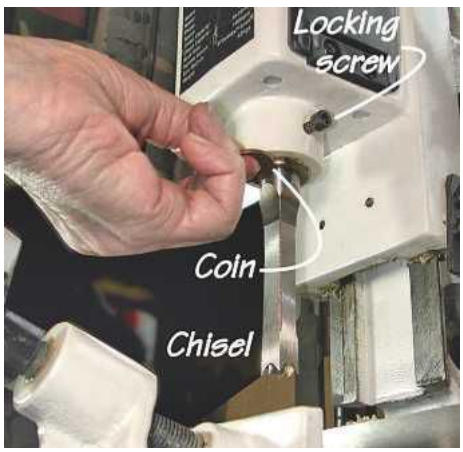
Essentially the chisel consists of a square bar bored out to accept an auger-style drill bit. One face is channelled to allow the escape of the waste and the cutting end is 'countersunk' with a 60° tool to form 30° cutting edges with four wickedly sharp points. As it is plunged into the job, the bit first removes a cylindrical core of waste **(Pic.2)** before the cutting edges form the square hole.

Setting up

I soon found that efficient waste clearance was essential (**Pic.3**). I followed the customary advice to set the empty chisel in the mounting flange **(Pic.1)** by first using a coin as a gauge to create a small gap between the shoulder of the chisel and the face of the flange (**Pic.2**).

To insert the auger I had to raise the head to its full height. After a few painful pricks from the chisel and auger points I learned to swap the coin into my right hand, which was useful for inserting the auger as far as it would go before I could finally tighten it with the chuck key (**Pic.4**).

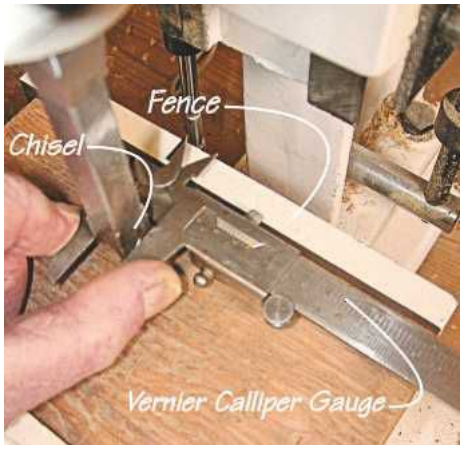
Next, I lowered the chisel to rest just above the work surface and temporarily fixed this position with the head rise stop; meanwhile I released the locking screw **(Pic.1)** and created a



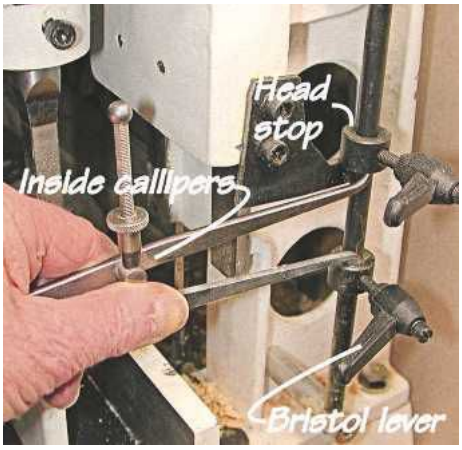
▲ Pic.2 **He plumped for the traditional method of setting up, using a coin to set the auger/chisel clearance**

▲ Pic.3 **A long-time advocate of hand-mortising, Jeff was keen to examine the machine finish on the tools**

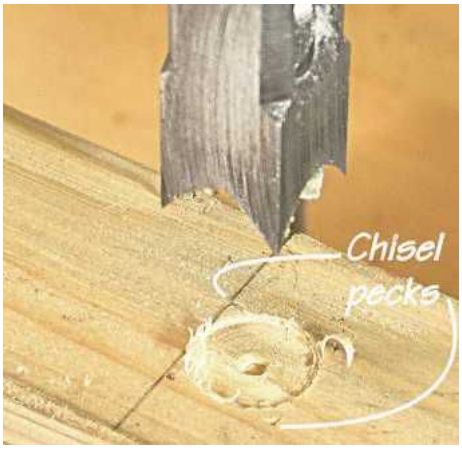
▲ Pic.4 **He found that the chuck had to be very firmly tightened**



▲ Pic.5 **In addition, Jeff was required to twist the chisel until the calliper's arm was parallel to the fence**

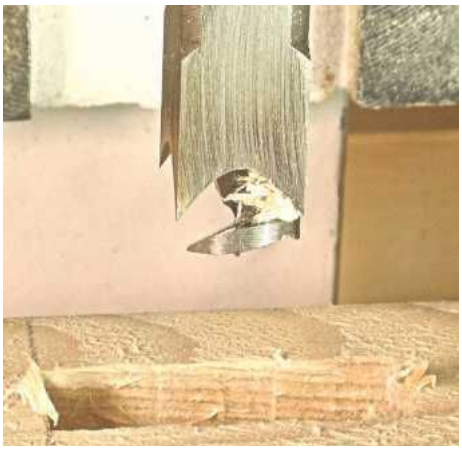


▲ Pic.6 **The stops are difficult to reach, so Jeff had to use callipers to set the mortise depth**



▲ Pic.7 **'Touching on' revealed that the chisel was unfortunately slightly off the pencil line**

▲ Pic.8 **Jeff was sure to follow the advice to cut each end before removing the remainder**



▲ Pic.9 **He also found that the auger could be pulled outwards**

clearance between the auger and chisel by pushing the chisel to nick fully into the flange, finger-tightening the screw while using a vernier calliper gauge as a jig to accurately align the chisel (**Pic.5**).

Setting off

If I were working by hand, I would have had to handle eight weighty legs to use the mortise gauge on all 24 of the mortises, so I was glad to find out that all that was required of me this time was simply to cramp the job with a datum face against either the table or the fence and then adjust the cross-feed knob **(Pic.1)** to set the chisel-to-fence distance.

With the head still in position I fixed the mortise length by traversing the table until one face of the chisel aligned with a mortise layout line, after which I slid and locked the length stop against the table before repeating this at the other end of the mortise. Still with the chisel fractionally clear of the wood, I used inside callipers to set the mortise depth stop (**Pic.6**) to the intended tenon length plus 3mm (⅛in) that allowed the customary clearance between a tenon and its mortise floor and an extra 5mm (13⁄64in) to allow for the gap between the effective parts of the chisel action and the top of the workpiece.

Delayed action

With the head at its full height, I would have had a long reach that would bring my hand very close to a rather rough wall **(inset in Pic.1),** so I decided to move the handle within easy reach by setting the chisel 50mm or so above the work.

After this I traversed the table against one of the length stops, located the workpiece until the appropriate chisel face was aligned with its corresponding pencil line and checked by 'touching on' (**Pic.7**). Having seen reviews of simpler mortisers, I was glad that my screw-operated clamp-cum-hold-down device made realignment a fairly simple matter.

Teething problems

I confess I was slightly alarmed by the steam, heat and eventual seizure that constituted the outcome of my very first efforts. Fearing an overheated chisel that would soon lose its hardness I withdrew the tool and actually had to remove the chisel assembly to forcibly extract the auger (**Pic.2**). I knew that I had adjusted the chisel according to instructions and concluded that it was perhaps unfair to trial my new tool on wood originally selected as more suitable for fencing than joinery, but I also wondered whether a smoother finish on both the auger flutes and the chisel's bore would have better eased the passage of the waste. However, this did bring home the necessity of frequently withdrawing the chisel and allowing the auger to spin until the waste appeared to be fully ejected.

I followed workshop lore by cutting each end of the mortise to its full depth **(Pic.8)** before removing the remainder, primarily to avoid the risk of chisel defection that can happen if only three of its edges are cutting. I have to say that I was most surprised by the effort required to pull the handle. At the very end of the plunge I found myself virtually hanging onto the lever as it reached a horizontal position.

My wallbench does not have through-mortises, but had I needed them I would have inverted the workpiece, taking care to avoid possible misalignment by keeping the datum face against the fence while 'drilling' from the other face.

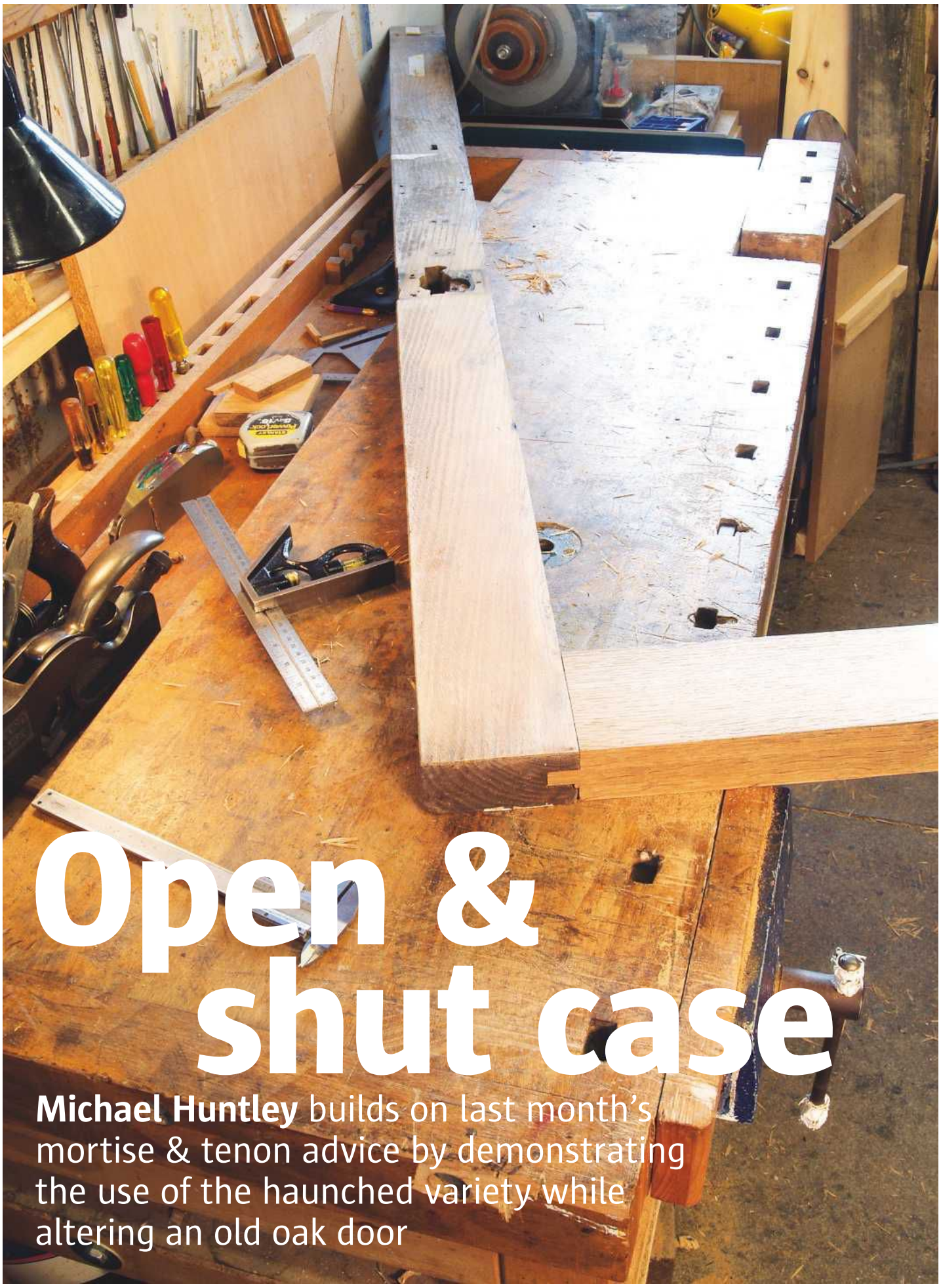
I continued mortising merrily away until a change in the machine's sound made me inspect the chisel whereon I found that the auger had been drawn partially out of the chuck (**Pic.9**). I suspect that this was due to inadequate chip clearance locking the auger in the tunnel, making it act rather like the nut of a screw thread, pulling the auger outwards as it turned.

My verdict

At great personal expense I feel I was able to exchange the pleasures of thumping a mortise chisel and levering out the waste for the satisfaction of swiftly producing clean and accurate mortises. The question is whether the need for speed can outweigh the need for enjoyment. The answer depends on the person providing it, so I'll leave it up to you.

Reference

Jeff's machine is the Axminster AW16BMST bench mortiser. Visit www.axminster.co.uk for more info.

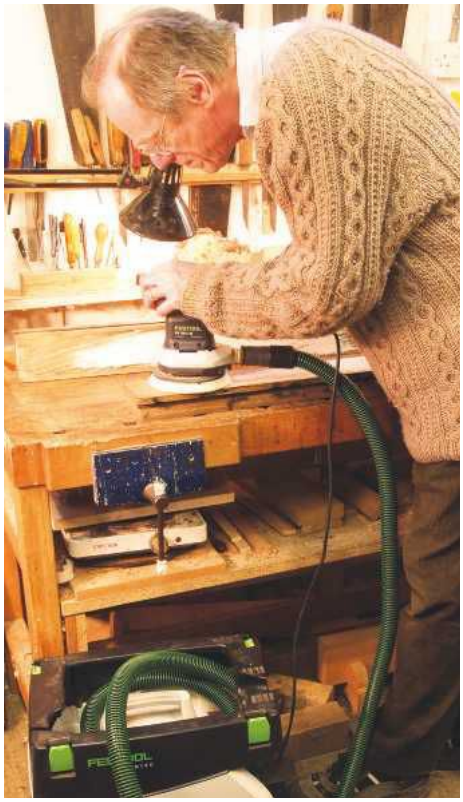


Open & shut case

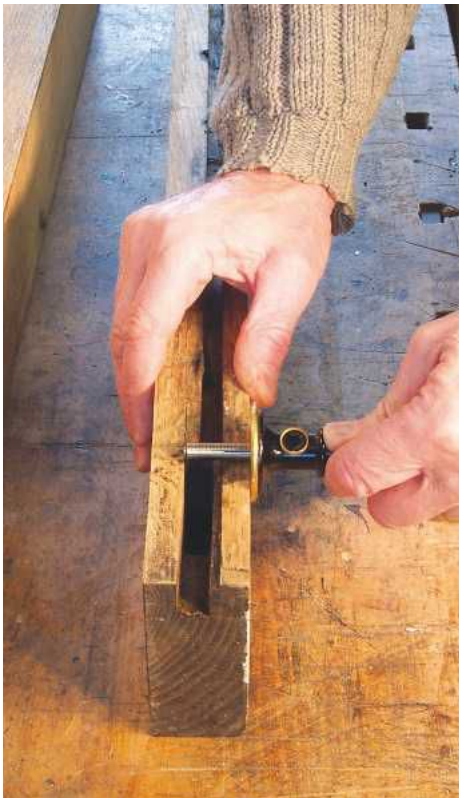
Michael Huntley builds on last month's mortise & tenon advice by demonstrating the use of the haunched variety while altering an old oak door

▲ Pic.1 **The door timbers disassembled**

▲ Pic.2 **Close up of the original mortise**



▲ Pic.3 **Sometimes a sander is very useful if you recycle timber**



▲ Pic.4 **A wheel gauge is expensive but easier to set than a pin gauge**

▲ Pic.5 **Vernier callipers are a must if using odd timber sizes**

One of the best ways of learning about woodwork is to repair old examples. If you are observant you can see how the joints were marked out and then cut. You also have the advantage of hindsight – you can see what went wrong. It might have been poor timber choice, weakening of timber by cutting a joint too close to the edge or even putting in a screw when glue or dowel would have been a better choice. But you do need to be aware that compromises are also required. Few amateurs are able to work with perfect timber on every job; you may have to accept the distortion that comes with age when you use, as I often do, recycled timber.

To illustrate a more complex mortise & tenon than the one last month I am going to show the repair of an oak door, the timber for which cost me nothing. Doors, if made properly, have mortise & tenon joints with wedges. The wedges compress the timber and will hold the door tight for years. This door (**Pic.1**) was in a bit of a mess when I got it! It had one good stile, one damaged stile and only two out of the three rails. Its saving grace was the fact that it was oak and that it could be knocked apart, a new piece spliced in and the rails shortened to fit my workshop door frame. The mortises were sound and traditionally made (**Pic.2**).

Preparation

I always give the old timber a quick going over with a sander (**Pic.3**). This makes it easier to see the marking lines later on and shows up any surface irregularities or, worse still, nails. My eyes are not so good now, so I do run a stripping knife over each face as well to feel for nails. Some people use an electronic pipe finder gizmo but I like my old stripping knife. You don't need a sander, you could use paper and a cork block. Don't use your fingers though – you will get through a box of plasters before you are finished!

Set square

Start by checking that the timber is as square as you can get it and that the door top and bottom are true; in other words ensure that the disassembled timbers are square in section at the crosscut ends and 'as best possible' in the middle. Remember we are working with recycled wood and don't have machines to square it up. Yes, we have hand planes but recycled timber can have nails in it, and I don't

▲ Pic.6 **Using the points to mark a dimension**

▲ Pic.7 **A little knife line that goes across the arris helps square around**

▲ Pic.8 **Offer the square up to the blade and run the line across the rail**

use my best planes on second-hand timber unless it is absolutely necessary.

Get marking

Identify your front face from which all marking will take place and mark it. Then use a gauge to mark the far face of the mortise and transfer this to the timber being used for the tenon – in this case a rail that is being shortened to make the door narrower – (**Pics.4** & **9**). Now we suddenly hit a hitch – the haunch. This is why we have jumped from Pic.4 to Pic. 9! The haunch is the most common variant of the mortise & tenon joint so I use it as an introduction to more difficult M & T joints. We need to set out the haunch before we can set out all of the tenon.

Had I been using a pencil then I could have rubbed out any unwanted marks but I find a knife more accurate and encourage students to use one from their first day onwards.

Measure the length of the tenon (**Pic.5**), which will be the same as the width of the stile. This is where it gets really important to understand terminology. The same dimension

▲ Pic.9 **Gauging down to the shoulder**

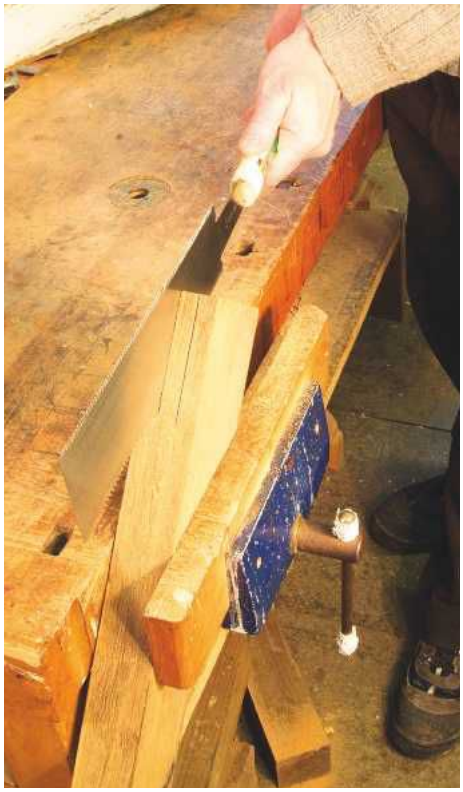
▲ Pic.10 **Using the wheel gauge as a depth gauge**

Measuring and marking tools

I use quite a lot of marking tools. Most people have too few of these so I thought it might be interesting to see my collection. The small engineer's squares and the little Chesterman 1986/1 depth gauge are most useful and only cost pennies. I include the small Japanese saw because it has a 0.5mm blade and is perfect for making very tiny adjustments. It comes from www.woodworkprojects.co.uk as does the green protractor. I could have added more measuring and marking tools like compass and trammel but those in the picture are the ones that I use all the time and encourage students to acquire.

▲ Pic.11 **Marking the haunch shoulder**

▲ Pic.12 **Offer up and check what you are doing**



▲ Pic.13 **A Japanese saw is best for tenons**

can be length and width because the stile is at 90° to the rails. Transfer this to the rail (**Pic.6**) and scribe a line for the first short shoulder.

To bring that shoulder line all the way around the rail make little cuts on the arris that joins the edge line to the face. You can then place your knife in the cut and slide the square up to it (**Pics.7** & **8**). On the edge with the haunch do not scribe a shoulder line right across. The shoulder line goes up to the edge of the haunch as can be seen in **Pic.12**. It stops at the near side of the haunch and starts again on the far side. This is why you needed to know where the faces of the tenon were but couldn't actually mark their full length until the haunch shoulder had been determined. It doesn't make a lot of sense when you read it but it becomes clear when you do it!

Finally, measure the depth of the haunch (**Pic.10**) and set that out on the rail (**Pic.11**). Gauge the near face of the mortise and set that out on the rail and you can then hatch in, in pencil, the waste using a different hatching for the haunch waste which is cut out after the tenon cheeks have been cut (**Pic.12**).

Cutting tenon

Cut the tenon in the usual way (**Pic.13**). Here I am using a Japanese pull saw from Workshop Heaven which is double sided, ie rip and cross-cut so you can so easily switch from one cut to the other, thus making it less likely to over-cut. I use a double-sided Japanese saw to do the rip first almost to depth, then the cross on a bench hook, being easily able to see how far down to cut because the rip kerf is already there, and then just tickle the rip to free the waste. It also has a blade that you can touch up yourself, for those who wish to sharpen saws. So much simpler than separate rip and cross backsaws, the whole job is done without switching saws.

I had cut the tenon a tad oversize so that it could be 'planed' in. Sharp-eyed readers will see that there is an odd little ledge on the mortise that had to be filled by leaving a little extra on the tenon. This can happen when grooves are run in stiles intended to accommodate tongued & grooved panels. Finally the tenon is cut to the size of the haunch and the wedges are made out of the haunch offcut, in this case at 8°.

Benefit of strength

It seems like a lot of fuss making mortises different depths and tenons different lengths in order to make a haunch but it is worth it and adds strength. The haunch means that there is a much wider bit of timber to resist twisting of the rail. Ideal proportions are ⅓rd for the haunch and ⅔rd for the tenon. On quality work the shoulder opposite the haunch (the 'inside' shoulder) is set back by 2mm to cover the edge of the mortise which might otherwise have been unsightly. On a window frame you have different depth mouldings and a rebate, all of which make a door joint seem very simple by comparison.

Of course, you can see the full range of mortise & tenon joints in either Hayward or Joyce. Not everyone wants to alter or make a door, but haunches are used in a great many situations when the mortise & tenon is on the outer corner edge of a frame.

▲ Pic.14 **Rail and stile assembled**

Suggested reading

C H Hayward – Woodwork Joints,
ISBN 0 237 44765 7
Ernest Joyce – The Technique of Furniture Making,
ISBN 0 7134 8814 X
Please also see my website at www.hsow.co.uk

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Boxing clever

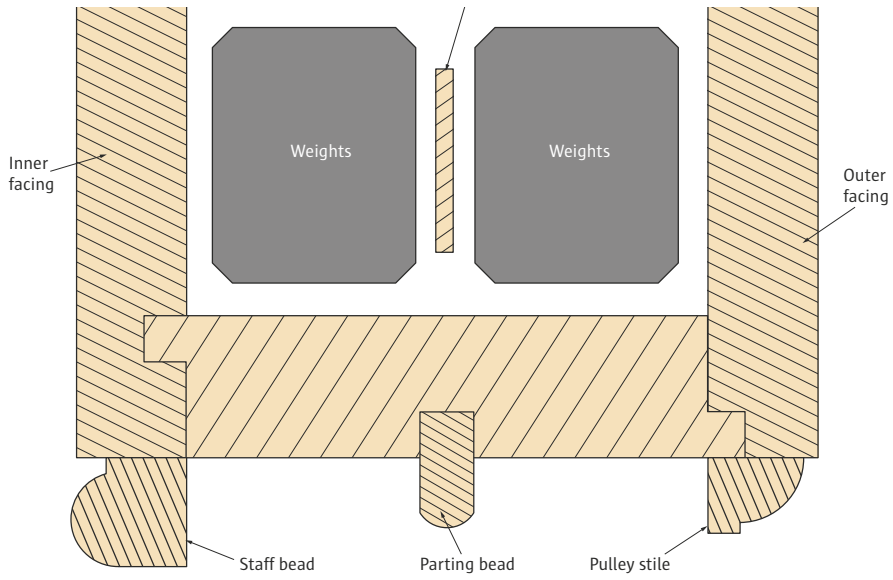
A commission for sliding sash windows could be a scary prospect, but follow **Mike Jordan's** techniques and you should be OK

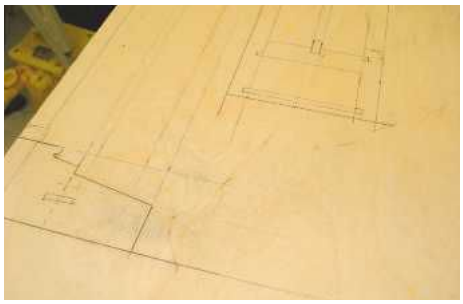
Often referred to as box windows or cased frames, this type of window must be one of the oldest forms of joinery still in regular use today. It began life some 400 years ago, employed in houses ranging from country mansions to workers' cottages.

People often complain that sashes rattle in their frames on windy days and that draughts are a problem. This isn't difficult to understand in frames that have reached a venerable age and a closer look often reveals that the wind is actually blowing between the frame and the brickwork. I've carried out repairs to windows which don't appear to have been replaced for more than a 100 years and some that appear to be even older. It's unlikely that modern plastic frames will be able to make this claim one day.

This design of window was particularly suited to use in the terraced properties where the opening of a casement window would have obstructed the passage of people walking by on

Fig.1 Section through head and sill





▲ Pic.1 **It's often helpful to set out your design on a rod before you start a project**

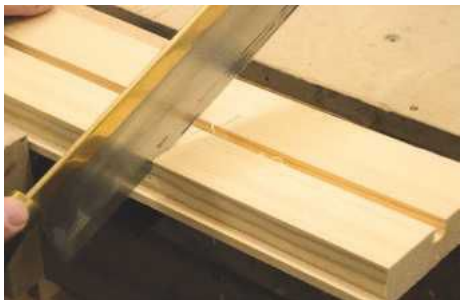
▲ Pic.2 **The cross sections of the pulley stiles and head of the frame are identical**

▲ Pic.3 **The inner faces need to be grooved and moulded to fit**

▲ Pic.4 **You'll need to cut an ovolo mould on the outer facings as shown**

▲ Pic.5 **A combination of router and mortising machine forms the recesses for the pulley wheels**

▲ Pic.6 **Sash pulleys are mortised into the stiles as shown**



▲ Pic.7 **Next, you need to cut the pockets for the weights – the 'mysterious' part of the project!**

▲ Pic.8 **After cutting with the gents saw, turn the work over and give it a sharp tap to free the pocket**

▲ Pic.9 **Remove the tongue from the back edge and plane off the last of the tongue...**

the pavement. Literally thousands of windows must have been made by local joiners at the time of the industrial revolution, most of these having been replaced in the last few decades with double-glazed frames of wood or plastic.

However, the current enthusiasm for preserving the past has led local authorities to prohibit the use of replacement windows and doors in plastic and require a return to traditional joinery. This is good news for those of us who can still remember how to make them! Sliding sash windows are seen by many as a specialist job, but they can still be a bread-and-butter item for any competent woodworker. The methods are very simple and would at one time have been used by joiners equipped only with hand tools.

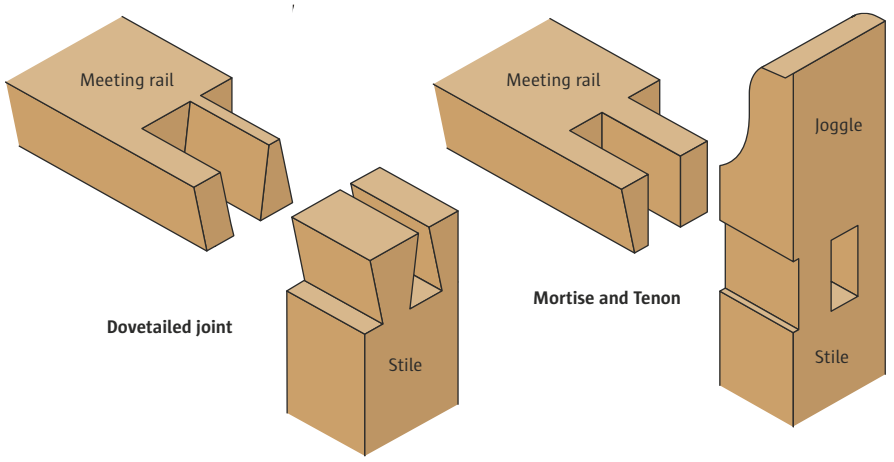
Today's joiner has a much more onerous task in trying to satisfy the demands of the local authorities' conservation officers though. They are usually convinced that repairs to a totally rotten frame are better than a replacement window, no matter how faithful the repro'. In terms of pricing, you'll need to bear in mind that you may be asked to attend site meetings, produce a model of the proposed window and paint it an exact colour before seeing even a tiny amount of grant money. All those extra jobs need paying for!

Sizing and variations

My favoured method of making exact replacement windows is to have one of the existing windows removed and transported to the workshop. This saves a lot of time sketching the various components and their moulds and sizes. It also makes a foolproof answer if there is any dispute over the accuracy of the replacement window. Removing an elderly window is one of the dirtiest jobs going, though! After many decades of coal fires, the filth that falls out and coats you will make you look like a poor chimney sweep.

As with other long-standing designs of joinery, sliding sash windows definitely have

Fig.2 Different joints used for added strength if joggles are omitted



many regional variations. One of these relates to the width of the glazing bars. Having looked at versions from the Cotswolds to Scotland it appears to me that there is a marked increase in the thickness of the glazing bars the further north you go, though this is merely my impression.

This type of window was originally intended to fit into a reveal (or rebate) in the brick or stonework with most of the face of the frame concealed. The windows I'm making here were not to be fitted in a reveal but in a normal window opening though. The plywood back to the weight box was fitted into two grooves at the back rather than being fitted into a groove in the back of the inner linings and being nailed to the back edge of the front liner. On this occasion two windows were required, made in pine with oak sills and meeting rails to match two others that I had made on a previous occasion for a customer in the same area.

One of the many things which can vary in the construction of these windows is the thickness of the sliding lights. This is not just a case of the larger the window the heavier the timber sections, but is also related to the thickness of the walls of the property. In the workers' cottages the walls are not normally thick enough to allow the lights to be more than 38mm thick.

Any increase in the thickness of the lights can only be accommodated by allowing the window to project into the room. Happily, the refurbishment of this type of property often includes dry lining of the inside faces of the outer walls. This can be planned to match the increased thickness of the windows.

Setting out

I have a horror of unnecessary drawing jobs. This type of window, however, is one case that calls for an old fashioned setting-out rod for every window. This was made simpler by the fact that the customer lives in a conservation area. The windows were therefore faithful reproductions of the originals and I took all sizes and moulding shapes from that source when making the previous windows. I established the thickness of the pulley stiles by removing a pocket piece.

Make a full-size rod of the overall window sizes, draw the timber sections onto this, only the frame being set out. The making of the various lengths of timber for the frame is easy since you are lifting the width and thickness straight from the rod and you can afford to make the lengths slightly longer than required. No allowance needs to be made for the joints since these are all simple housings or tongue & groove joints.

Pulley stiles and head

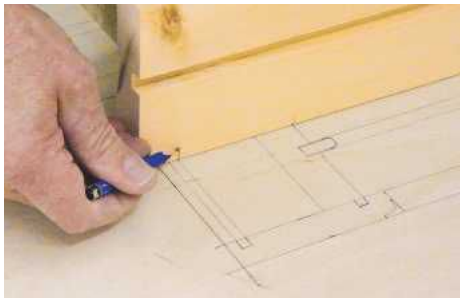
The cross sections of the pulley stiles and head of the frame are identical; the head is normally cut to the required width of the finished window and the pulley stiles to the full height. With this information you can machine the materials to size and shape before grooving the inner faces, and grooving and moulding the outer faces of the boxes to fit.

With the components made you can now start on the construction. A combination of the router and mortising machine is ideal for forming the recesses for the pulley wheels. Don't forget to make the stiles in pairs! It's as well to mark them all out together to ensure that you don't have any pulley recesses at the bottom of the stiles.

Cutting the pockets

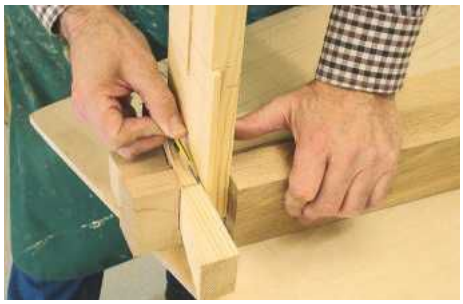
Now comes the part shrouded in myth and mystery – the cutting of the pockets for inserting the weights. The traditional method shown to me as an apprentice went like this:

▲ Pic.10 **...then fasten the pocket piece back into its stile with a countersunk screw**



▲ Pic.11 **The head is marked for trenching out by lifting the sizes directly from the rod**

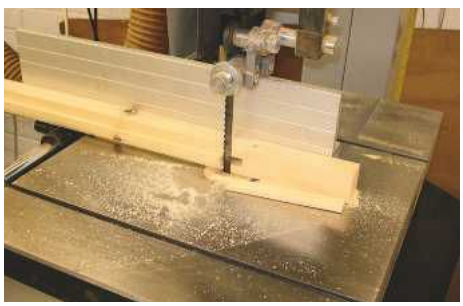
▲ Pic.12 **The trenches can be cut by various methods, a radial arm saw being the quickest**



▲ Pic.13 **A wedge is used to mark the angle for the outside edge of the trench which is cut by handsaw**

▲ Pic.14 **The head, sill and pulley stiles can now be assembled and placed to one side**

▲ Pic.15 **Mortise & tenons joint the sashes, only the joint between the rails and stiles differing**



▲ Pic.16 **The bottom of the top stiles and the top of the bottom are left over length to allow 'joggles'**

▲ Pic.17 **Not just decorative, joggles strengthen the joint between the stile and meeting rail**

▲ Pic.18 **Check the glass panes are the same size; measure the distance between top and bottom rail**

First, make the vertical cut which extends the parting bead groove right through the pulley stile. This was normally done by lowering the pulley stile onto a rotating circular saw blade to make a cut slightly longer than the planned pocket piece. If you survived this bit you then made both cuts at the top of the pocket and the cut at the inside bottom using the thinnest saw you had available, usually a 'gents' saw as shown in the pictures. Then came the final blow – quite literally! The cut at the bottom outside of the pocket had a tool all to itself, a sash pocket chisel; this has a blade about 60mm wide and looks like a cross between a paint scraper and a wood chisel. After anointing the pulley stile with boiling water in the area to be cut and dipping the sharpened chisel in the same, the final cut was made with one single blow with a mallet driving the chisel half way through the stile, cutting and releasing the pocket piece in one mighty wallop!

This all avoided removing material in the form of sawdust from the bottom cut and made the completed pocket piece a tighter fit. However, I recommend that you use a more enlightened and safety conscious system. You can easily achieve the vertical cut using a 6mm twin-flute cutter in the router working from the back face of the stile. All the cross-grain cuts are then made with the gents saw before turning the pulley stile over and breaking the pocket piece out with a sharp tap at the bottom.

After removing the tongue from the back edge and any remaining trace of the parting bead groove from the pocket piece you fasten it back into its stile with a countersunk screw. Push the pocket piece gently upwards to tighten the top joint before driving the screw home; a stroke of the plane ensures that the pocket piece is flush.

Mark the head for trenching out by lifting the sizes directly from the full-size drawing. The trenches can be cut by various methods, a radial arm saw probably being the quickest. The ends of the head also need to be slotted to house the wagtail.

Hardwood sill

The sill needs to be sunk and rebated as shown before the position of the trenches for the pulley stiles are again picked up from the full-size drawing. Unlike the head where the pulley stiles need to be a close fit in the trenches, you fit the sill to the pulley stiles using wedges. Use a pre-cut wedge to mark the angle for the outside edge of the trench, which you then cut by handsaw.

The ends of the sill also need to be cut back by the thickness of the facings to allow them to nail on flush with the inner and outer face of the sill. The head, sill, and pulley stiles can now be assembled and placed on one side while the sashes are made.

Making the sashes

The sashes are normally made of softwood but in some instances the meeting rails are upgraded to hardwood to improve strength and durability, as I've done here. Make the meeting rails thicker than the rest of the sash by an amount slightly less than the thickness of the parting bead; this extra thickness allows the meeting rails to touch at an angle when the sashes are in the closed position. Use conventional mortise & tenon joints to joint the sashes, only the joint between the meeting rails and stiles differing.

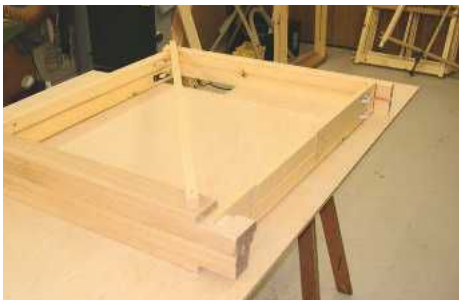
Leave the bottom of the top stiles and the top of the bottom stiles over length to allow 'joggles' to be formed on the ends. These have several functions apart from decoration; they strengthen the joint between the stile and meeting rail and they make the sashes greater in effective height and ensure they slide easily rather than trapping. They also act as a last ditch safety measure if the cords on an old window are broken and the sash comes crashing down when the catch is released. If the joggles are not to be included in the design, it's normal to use a form of dovetail joint between stiles and meeting rails to get maximum strength.

Usually, it is important that the panes of glass in the sashes are all the same size, particularly when multiple panes are involved. The simple trick to ensure this is to set out the sashes together. Place the top rail of the top sash and the bottom rail of the bottom sash to give the correct overall height, then measure the distance between the inside edges of these two rails to position the meeting rail mortises exactly central between the two points. This system won't suit all patterns of glazing bars – some styles of window have carried the patterns to extremes.

To ensure maximum strength, where vertical glazing bars are fitted they should always run the full height of the sash and be through-tenoned and wedged at the meeting rails.

I chose to use a short scribe on the moulding of the sashes (this method was shown in detail, *GW*201:38). This allows you to use square shoulders on the tenons and also means that cutting the moulding off with a bandsaw leaves the stile ends ready for the joggles to be cut.

▲ Pic.19 **Vertical glazing bars should always run the full height of the sash and be through tenoned and wedged at meeting rails**



▲ Pic.20 **Before the inner and outer facings are glued and nailed in place, screw on a temporary lath to hold the frame square**

▲ Pic.21 **The outer faces will need the mouldings mitred at the top corners and cut out to sit on the sill**

▲ Pic.22 **Finally, nail the inner and outer facings together and put to one side**

▲ Pic.23 **The sashes are sanded, the horns and wedges are cleaned off level and the rebate formed in the bottom rail**

▲ Pic.24 **The sashes need a groove in their outer top edges to clear the sash cords and pulley wheels**

▲ Pic.25 **Two holes need to be drilled, one 8mm hole for the cord and one 32mm hole for the knot**

I've been grounded and don't climb ladders any more, so this job went to two local lads. The brickwork opening proved to be a little rough when the old window was removed, but I'm delighted to say that the windows fitted and were soon wedged in place. Unusually the openings had no conventional stone sills but rely on a cement weather edge on the bottom to shed the water.

▲ Pic.26 **Mould the parting and staff bead; cut and fit the parting beads with the outer sash**

▲ Pic.27 **The final move is to hang the wagtail in place and slide in the 6mm ply back**

▲ Pic.28 **All that remains is to attach the sash cords and counterbalance weights**

Building the boxes

When the glue on the basic window frame is set the inner and outer facings can be glued and nailed in place. Before commencing it's a good idea to screw on a temporary lath to hold the frame square until you've nailed one set of faces in place. The outer faces will need the mouldings mitred at the top corners and cut out to sit on the sill; the inner facings are square edged and butt jointed at the top. Take care to ensure that you don't nail in the pocket piece!

Reinforce the butt joints between the side and head facings with rubbed-in glue blocks inside the top box, and put the whole assembly on one side while the glue sets.

Sash cord fixings

Sand the sashes, clean the horns and wedges off level and form the rebate in the bottom rail to fit the sill profile. The ends of the meeting rails need to be trimmed to clear the parting beads.

The sashes need a groove cutting in their outer top edges to clear the sash cords and pulley wheels. When these are complete the holes used to fix the sash cords can be drilled. The 8mm hole for the cord can best be made with an old-fashioned brace and bit. The hole for the knot is 32 x 30mm deep and should be drilled first with a flat bit. The alternative is to machine a longer groove in the sash and nail the cord in place.

Final assembly

With the parting and staff beads made and moulded, cut the parting beads and fit with the outer sash in place for test fitting. Add the inner sash and make any adjustments to the fit before mitring the staff beads to length and nailing them in place. I usually nail the top, bottom, and one vertical bead, leaving the other vertical bead to be screwed in place to provide access for things like cord replacement.

The final move is to hang the wagtail in place and slide in the 6mm ply back

Fitting the sash cords and weights

All that now remains is to attach the sash cords and counterbalance weights. You need to weigh the sashes in their completed state, complete with the glass and putty. A spring balance is the proper tool for the task, but bathroom scales will do the same job.

In the distant past ironmongers would carry a stock of cast-iron weights in a wide range of sizes; sending the new lad to the shop for a long wait was a standard jest throughout the trade. Weights only seem to be available now from specialist suppliers and are made of square-section lead with a hole through the middle for the sash cord. The suppliers provide a chart giving details of what length to cut for any required weight.

Your second best handsaw is recommended for cutting the lead. The object of the exercise is to make the weights attached to the top sash slightly heavier than the sash, which encourages it to stay at the top of the frame. Conversely the bottom sash should be slightly heavier than the weights to keep it at the bottom.

The difference in weight is supposed to be about 250g more or less than the sash, but admittedly I've made replacement windows before and recycled the old cast weights which have been markedly different in weight without any problems occurring!

After cutting the weights to size, use a lead 'mouse' to thread string over the pulley wheels. This in turn is used to pull through the sash cord which can be left in one continuous length and cut off as you hang the weights and sashes.

When the sashes are hung, and the pocket pieces and beads are replaced, you just have to fit the fastener and the window is complete.

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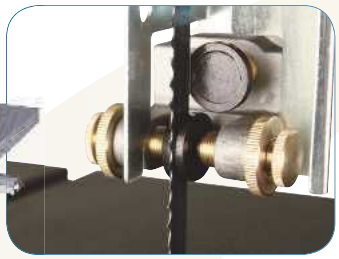

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Ercol a-like

Martin Aplin pays homage to Lucian Ercolani with this take on his Arts & Crafts case with exposed lapped dovetails

Ercol has never produced a wall-hung corner cabinet in this style, making Martin's a pretty unique piece! It's in ash, the timber that Ercolani is famed for 'taming'

I've long been an admirer of the clean modern look of the Ercol Windsor range, with its Arts & Crafts influence, particularly the exposed lapped dovetails on the carcases. I also appreciate that the furniture retains a hand-made look, though it's now produced in a modern factory using the latest woodworking technology.

I've been trying to find the time to make a wall-hung corner cabinet to match several other items of Ercol furniture I own, so changing this regular series of articles to focus on contemporary style presented me with the ideal opportunity to make such an item.

A unique edition

As far as I know, Ercol has never produced a wall-hung corner cabinet in this style, so mine would be a unique item. The construction of the piece is basically frame & panel, with a dovetail-jointed carcase and adjustable shelving.

The choice of timber was straightforward, as much of the Windsor range is produced in American ash or elm – the wood Lucian Ercolani famously 'tamed'. As many of my other pieces were in ash, I've chosen it for this piece too. The timber I bought varied in colour and grain from a very pale blonde to a much darker brown, so I used the different colours to add interest to the design.

From the top down

I started work on the top and bottom panels, using the darker brown timber. These are slightly different in size; the top panel has a curved overhang, so this needs to be allowed for when setting out the boards.

Having prepared the timber to size, lay out the boards to achieve the best grain pattern while alternating the growth rings to minimise the risk of cupping. When you're happy with the layout, mark each board so its relative position is known, then draw the outlines of the top and bottom panels.

Biscuits for strength

As these panels – and especially the top – bear the weight of the cabinet, the boards are biscuit-jointed for strength. Mark the positions of the biscuits with care to ensure that they won't be exposed when the panels are cut to shape. Cut the biscuit slots, glue up the boards and cramp them.

When the glue has set, cut the panels to shape. I used a table saw fitted with a sliding carriage and adjustable fence. If this is accurately set, it is quite easy to make the 45° cuts.

Matching jigs

I decided from the outset that I would cut the dovetails using a router and dovetail jig, as this fitted well with the methods used in the Ercol factory. The joints are cut at 45° to the

▲ Pic.1 **Having planed the boards to size, mark out the top and bottom panels to determine the positions of the biscuits**

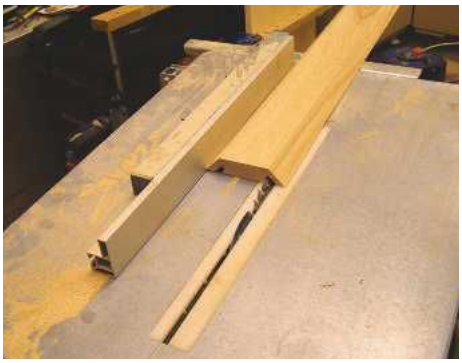
▲ Pic.2 **Clamp the boards to the bench, then cut the slots for the biscuits and brush glue into them**

▲ Pic.3 **Clamp the boards together, applying the clamps above and below to even out the clamping forces**

▲ Pic.4 **Use the table saw to trim the top and bottom panels to shape and size, then clean up both faces using planes and scrapers**

▲ Pic.5 **An inexpensive routing jig produces dovetails to the same pitch as on Ercol production furniture**

▲ Pic.6 **Martin produced the dovetail housings at 45° to the grain but they still retain much of their strength**



▲ Pic.7 **Cut the grooves in the rear post for the infill panels using the table saw with the blade at 45°. The guard has been removed for clarity**

▲ Pic.8 **Form grooves for the side panels in the front uprights and the top and panel. They should line up on assembly**

grain of the timbers, and although I wasn't worried about any loss of strength, the router-cut tails and pins are quite small so not too much timber is removed, and a strong joint is still produced.

Router jigs typically produce a pin spacing of 25mm – coincidently the same spacing as on Ercol furniture. This spacing determines the width of the front uprights, in this case exactly 127mm wide. Allow an extra 10mm on each end of these uprights for the dovetails.

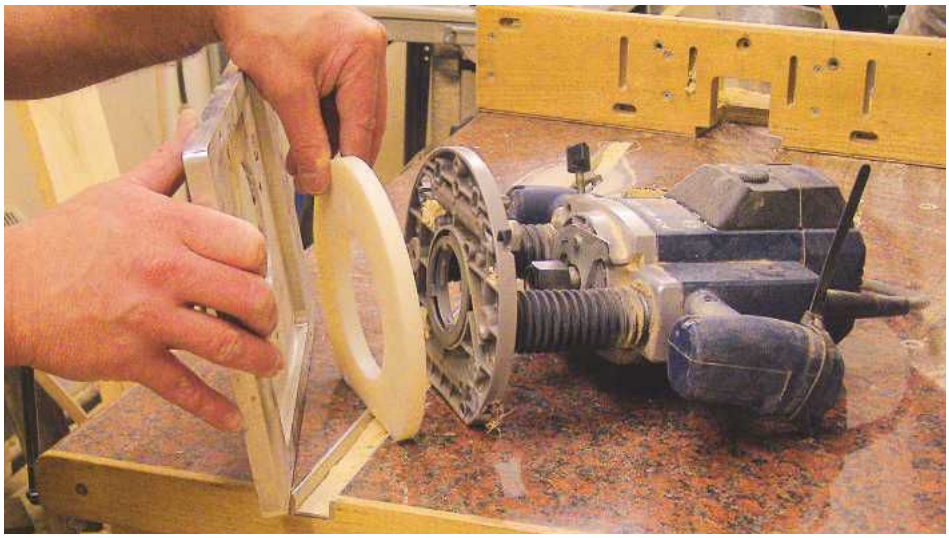
Set up the jig using some test pieces machined to the same size as the uprights. Adjust the jig until a good fit is achieved for the joint before cutting the parts for real.

Awkward angles

The rear upright is the most difficult part to make, mainly because of the angled and bevel cuts involved. Mark the width of the upright off from the top and bottom panels, when flush with their rear faces, and cut it to size on the table saw with the blade set over at 45°.

Grooves for the side panels are required, and I decided that the table saw would probably be the best way to cut them. With the saw blade tilt set over, the timber face could be held flat on the saw table, keeping the cut stable.

My saw allows me to remove the guard while keeping the riving knife in place. I made up a temporary guard from MDF and clamped it in position. The fence needs to be carefully positioned to produce the groove in the right

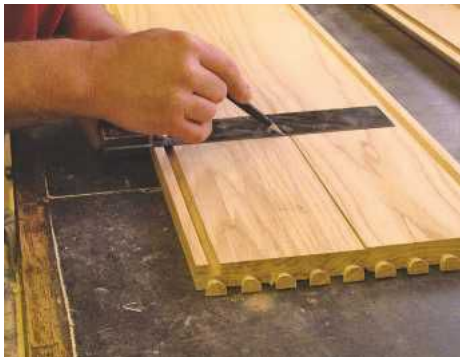


▲ Pic.9 **Fit a spacer ring between the router base and the table mounting plate so a panel-raising cutter can be fitted**

▲ Pic.10 **Large-diameter cutters such as panel-raising types should be used only in a table-mounted router**

▲ Pic.11 **Check the fit of a panel in the routed grooves. Remember that the finish will increase the thickness marginally**

▲ Pic.12 **Bandsaw the curved front edge to the top panel to shape. Then plane it smooth and create the bevel**



▲ Pic.13 **Place the front uprights back-to-back and mark off the positions of the shelf sockets. Transfer these to the back upright**

▲ Pic.14 **Use a mortise gauge to mark the position of the shelf sockets centrally on the rear upright, then drill the holes**

▲ Pic.15 **Use Miller dowels to join the top and bottom panels to the rear upright. A special stepped drill forms the holes**

place, and as the saw cut is much narrower than the groove required, the fence needs to be moved over slightly and subsequent cuts taken. When the grooves have been formed, trim the upright to length, this being the exact distance between the top and bottom panels. This is secured with dowels, as explained later.

Routed grooves

Grooves need to be made in the top and bottom panel, and the front uprights, for the side panels to fit in. These were produced on the router table. The grooves need to be aligned with the dovetail pins, and must not be any wider than the neck of the dovetails, or the groove will show when the joint is assembled.

Fielded panels

The side panels are made up of several of the very pale timber boards edge-jointed together. As they aren't loadbearing I didn't use biscuits, just relying instead on a rubbed joint. To check the exact size of the boards, dry-assemble the cabinet and measure the openings, and add on about 16mm to each dimension. As the grooves are 10mm deep, this will allow for a 4mm expansion gap.

The panels are fielded using a suitable cutter fitted to the table-mounted router; due to their size, these cutters mustn't be used freehand. The cutters also create a raised panel if the cut is taken too deep, so to prevent this I turned the panels over and machined in from the back face to achieve the required thickness.

When making any frame & panel furniture it's good practice to finish the panels completely before assembly. As the panels may move in the grooves, this will prevent any unfinished areas from showing.

Dowelled together

The rear upright is fixed in place using Miller dowels – a proprietary fixing system using a stepped dowel which is driven into a matching stepped hole formed with a special drill bit. Screws are not an acceptable method of attaching the upright, as screwing into end grain gives a very weak fixing.

Dry-assemble the cabinet, having marked off the positions of the dowels on the rear edges of the top and bottom panels. Prepare the hole with the stepped drill bit, drilling to the depth indicated on the drill shank.

Curve and bevel

The top panel has a curved front edge that overhangs the cabinet. Draw a shallow curve using a thin strip of wood bent to shape as a guide, remove the waste timber with the bandsaw and plane and sand the edge to shape. The underside of the curved front face is bevelled. Plane this to shape, then sand it smooth with abrasive paper wrapped around a sanding block to keep the bevel flat.

Socket holes

The last task before final assembly was to drill the holes for the shelf supports. I found some good-quality brass studs which slide into tubular sockets. The holes could be drilled using a template, but I relied on carefully marking out the positions and sighting the drill bit by eye.

The easiest way to mark out the holes was to align the two front uprights back to back and mark out the horizontal positions. I then transferred these positions to the rear upright; be sure to mark off from the correct end if the holes are not equally offset from each end. The vertical positions were marked off using a marking gauge.

Assembly time

With all the parts made, you can start the assembly. Apply glue to the dovetail joints and assemble the front uprights. Drop the side panels into their grooves and slide the rear upright into place, locating it over the side panels. Assemble the top panel to the front uprights and then secure the rear upright by inserting the glued Miller dowels.

Stuck sockets

After assembly, the shelf sockets can be fitted into their pre-drilled holes. Coat the outside of each socket with a thin film of two-part epoxy adhesive and push it into its hole. I used a short piece of dowel with a reduced diameter end to push them in. Remove any excess adhesive once it has set hard.

Shelf template

The shelves are quite straightforward to make, using a template cut from a piece of thin plywood or MDF. The shelves are again made up of several boards, edge-jointed together. Once they're cleaned up and trimmed to shape, plane a bevel on the underside of each one to match that on the top panel.

Cut recesses for the shelf studs into the underside of the shelves so that they're not seen and the shelves appear to be floating. Mark the positions of these recesses by placing each shelf in position in turn and marking around the studs. Remove the shelf and use a brad point drill to make a recess deep enough for the studs. Then remove the timber between the recess and the outside face of the shelf with a sharp chisel.

Ready to hang

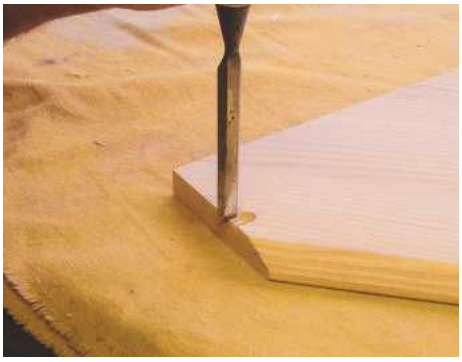
The final task is to fix a couple of mirror plates to the back edge of the top panel. To allow the cabinet to hang flush with the wall, the plates are fitted into shallow recesses, and are secured with long screws inserted in pre-drilled holes. This will prevent the timber from splitting and spreads the weight of the cabinet over a wider area.

▲ Pic.16 **Glue the dowels and hammer them in. Then cut them nearly flush and plane them smooth**

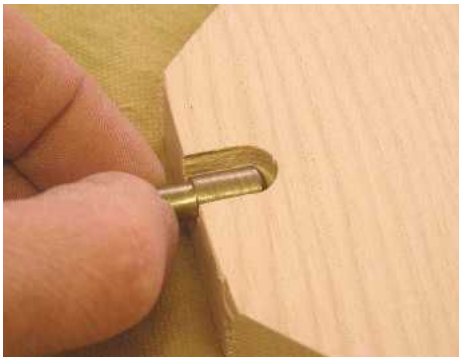
▲ Pic.17 **Glue the shelf support sockets into their holes with epoxy adhesive. Push them in using a piece of dowel**

▲ Pic.18 **Use an offcut of thin plywood to make an accurate template for the shelves, and cut them to size**

▲ Pic.19 **Mark the position of the shelf stud recess by placing each shelf in the cabinet and drawing round it**



▲ Pic.20 **Remove most of the waste with a brad-point drill, then trim out the rest with a sharp chisel**



▲ Pic.21 **Check that the shelf support studs fit easily into their recesses before fitting the shelves**

▲ Pic.22 **Chisel out the recesses for the hanging plates in the rear edge of the top panel and screw the plates on**

HOUSE NUMBER SEVEN

Scottish spruce Glu-Lam frame, Scottish larch T&G, reclaimed pitch pine

We were commissioned in October 2010 to produce a design for a new 3-bedroom house on the site of a ruined, B-listed black-house on the Isle of Tiree on the west coast of Scotland. We developed a concept that comprises two houses, a Living-house and a Guesthouse, linked by a Utility wing. Together the elements combine to create a bold insertion into the landscape while reflecting the character and heritage of the island. The cottage (Guesthouse) is built using traditional timber frame techniques, but the roof of the Utility block and the Living House are structured using a CNC-cut spruce Glu-Lam frame. The shape and form of the structure was developed through a careful analysis of the local vernacular. Having decided on these curved forms, we then debated the best method of construction to create a robust island living environment that was sustainable, strong and most importantly easily shipped over on a Cal-Mac ferry. We developed a solution that split the roof portions along the apex to allow for ease of transport and connection on site. This allowed the contractors to erect the frame quickly and safely in the inclement weather. In addition to the Glu-Lam frame, the internal finishes are worthy of note as we used pine of differing characters internally. Pine tongue & groove boards are prevalent throughout the Highlands & Islands and we decided that using this traditional material in a slightly different way could give us an interesting internal feel while still being relevant to the islands. With this in mind, we have a pitch-pine worktop, pine skirting boards used as the cladding to the ceilings of two of the main spaces and the sculptural stairs to the hall. These stairs were laid like Jenga blocks on site after being milled to size from reclaimed Victorian pitch pine beams.

Murray Kerr, Denizen Works,
London E2 9DG, www.denizenworks.com

House No.7 Tiree, Scotland

Difficult project

This month's Centrefold is devoted to a Wood Awards shortlisted entry that was constructed in one of the more inhospitable parts of the UK, on a Hebridean island too far north for trees to grow, meaning that with the best will in the world 'locally sourced' had to refer to Scottish mainland, with all the materials brought over by ferries which are subject to weather delays.

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Sofa so good

Itching to paint again, **Mike Riley** reuses the frame from an old futon to make himself an easel

I used to paint a bit – not masterpieces by any stretch of the imagination – but then for some reason I stopped.

It may have been due to moving flats and no longer having the space, or possibly some other issue, but of late I've noticed a spate of appealing exhibitions at Tate Modern. As a result, the urge to make an awful mess with paints came upon me again so I took off to the shops and bought a student set of acrylics, a tub of gesso and some painting knives.

When I painted in the past, I used to lay the canvas on the kitchen table but this time round I fancied an easel so I went online looking for one. I wanted a large studio easel and trawled around various websites looking for ideas, eventually settling on two basic shapes. One was H-shaped with a central post on which the shelves sat and the other was a single upright which supported the shelves and the centre of the canvas only. I decided to go for the H-frame, it looked more sturdy and would support the large panels I intend to use.

The problem was the cost, being anywhere from a couple of hundred pounds to over a thousand. Considering that there couldn't be more than £30 to £40 worth of timber involved I went off to the woodpile to see what was available.

Timber supply

My woodpile is increasingly well stocked, but I didn't really want to build the thing out of black walnut, maple or elm. It's going to get abused, covered in paint and all sorts of unpleasantness, so furniture-grade wood would be a complete waste. On the other hand I didn't want to build a plywood and MDF monstrosity. Time for a cuppa and a think.

Then I had a light bulb moment. Almost 20 years ago when we moved into our one-bedroom flat in London we bought a futon-type sofa bed for the occasional guest who might

▲ Mike used an old futon bed frame to build his artist's easel

▲ The timber, which looks like engineered beech, cleaned up nicely

▲ Marking one piece from another

▲ Detail – the end of the centre post

▲ Red dust from Mike's mystery timber

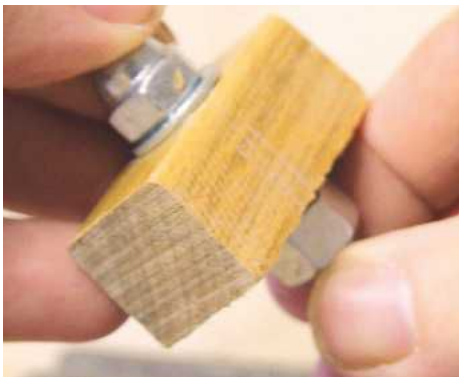
pass through. The mattress has long since fallen apart but the wooden frame has been sat in the attic for the past six years. Thinking that there must surely be enough timber in a sofa bed to build an easel with, I pulled it all out of the attic and set to work recycling it.

It was surprisingly easy to dismantle, a few well-aimed swings of the mallet and the battle was over – at least, I thought it was. In reality the enemy had simply slipped from the battlefield leaving nasty surprises in the shape of a million nails embedded in the wood behind. It took the best part of an afternoon with a pair of pliers to get the nails out and even then I didn't manage to remove all of them. Some, the pliers simply cut the heads off leaving the shank embedded, while a couple just refused to be moved. As most of the metal work had been inserted in a uniform fashion I was able to plan my cuts around them and so pieces with the recalcitrant nails became waste.

Eventually I had a pile of stock timber. On closer examination it appears to be a kind of engineered beech, engineered in as much as sections of it are made from smaller boards which have been machined together with very fine finger joints. The boards, as they were now, also showed signs of their previous life; some had rebates formed on the end, some sections had various holes in and so on. I wasn't concerned with the holes – there was nothing that would get in the way of what I laughingly refer to as my design.

Four steps

I broke the build down into four sections, choosing and preparing the material from the pile as I went. The four sections were the H-frame, the base, the shelves and the support.



▲ The shelves are held by Mike's bolt and block assembly, the dome nut held captive by lots and lots of superglue

The base was simple: four pieces joined by lap joints at each end gave me a basic footprint for the easel. I drilled the sides with a Forstner bit so that I could later fit a large dowel through as a hinge between the frame and the base. Once the square base was constructed I fitted a foot at each corner.

The H-frame was next. The rebates on what had been the slats in the sofa back slotted into the rebates in what had been the sides to give me the basic frame shape I was after. I glued them in place and then nailed them in for extra security.

The centre post was formed from one long section of sofa which I ripped along its length on the bandsaw to provide a channel to pass the shelf locking mechanism through. I could also set a block into it to hold the shelves at 90°.

The shelves for the easel were fairly simple constructions. The lower shelf is slightly different in as much as it has an L-shaped profile to provide a slightly deeper surface for a panel to sit on. The wood I used for the lower shelf came from the stash of a deceased relative who hoarded bits of wood for repairing his yacht. I have no idea what the wood is, but it gave off a fine unpleasant reddish dust when put through the bandsaw. It planed well though and took an attractive finish from the iron.

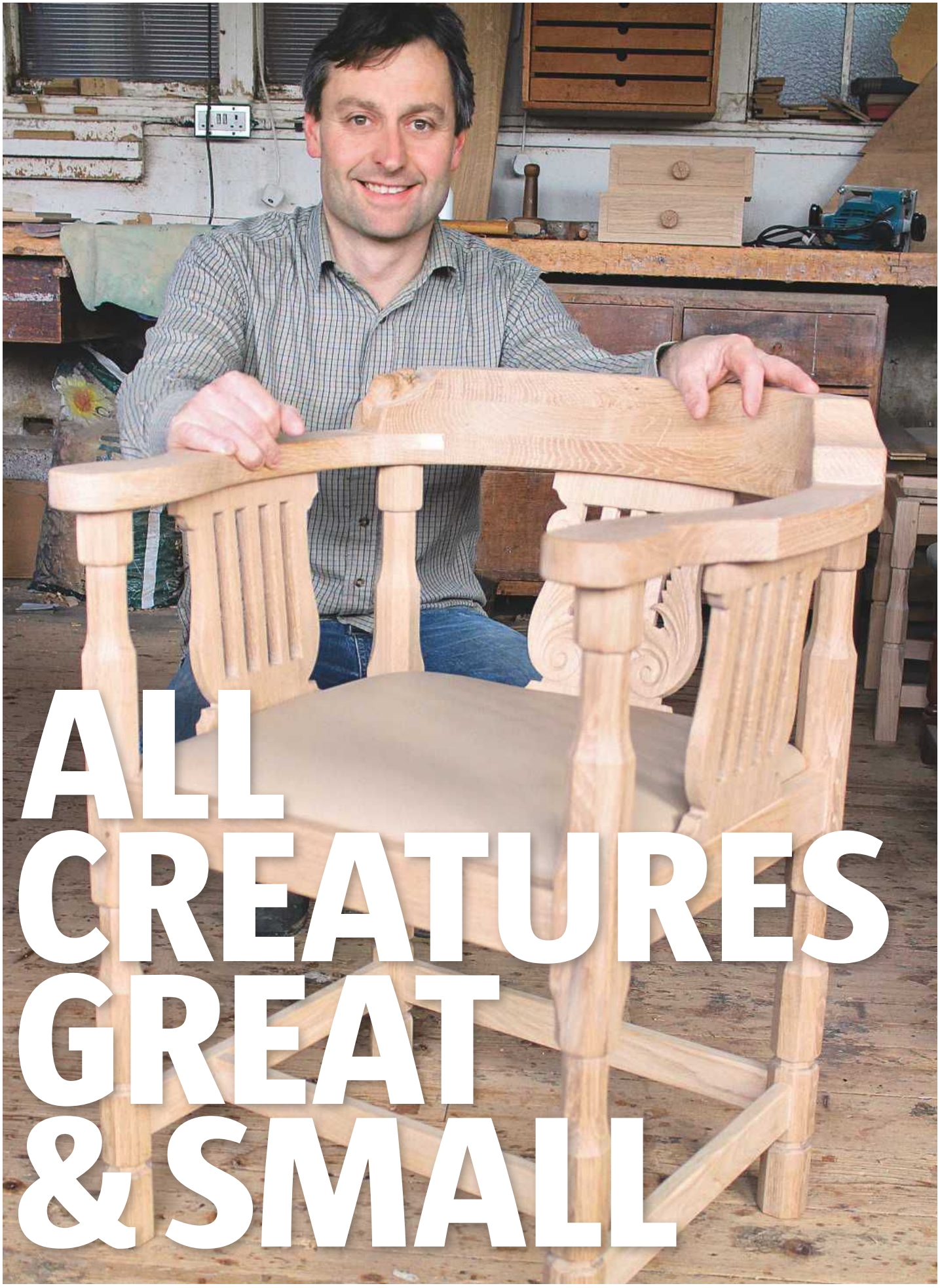
The shelves are moved by means of releasing a bolt which runs through the shelf and guide-block assembly, through the centre post and into a threaded insert set in a clamp block on the rear of the easel. The bolts I made from 8mm threaded rod with a knob on the end by means of a threaded insert and dome nut, the inside surfaces of which I coated liberally with superglue. It seems quite strong.

Finishing up

All that remained to do was the rear support which is simply two legs, one on either side which swing out and rest against the inside of the base to hold the front up. Once the supports were in place it was assembly time.

The finished easel is quite stable and sturdy and I'm pleased that the sofa bed has been given a new lease of life rather than ending its days in a landfill. Having never had an easel before I'm looking forward to trying it out though I have to win it back first from the boy who has decided that it's better than the easel I made him a few years ago. His has a blackboard surface though, so perhaps I should just give him my oils and take up the chalks instead.

Photographs by Mark Cass unless otherwise stated



ALL CREATURES GREAT & SMALL

How many of us can resist looking at other woodworkers' furniture when we come across it on holiday? **Andrea Hargreaves** follows a furniture trail in North Yorkshire and comes across some unexpected wildlife

Inside Beaver Furniture's showroom

A beaver is incised onto this rack

Beavering away in a light-filled workshop

What better time to get in the car and have a little road trip than early spring when the daffodils are out and there's still not much traffic on country roads. I never miss an opportunity to combine business with pleasure, and having an appointment in Scarborough started browsing on the web and hit on the Thirsk Furniture Trail, promising ten makers to visit in the stunning countryside made famous by the TV series about vet James Herriot. Actually there are nine listed on the very helpful map so I got going and found myself in a world of beavers, squirrels, wrens,swans and even a unicorn or two...

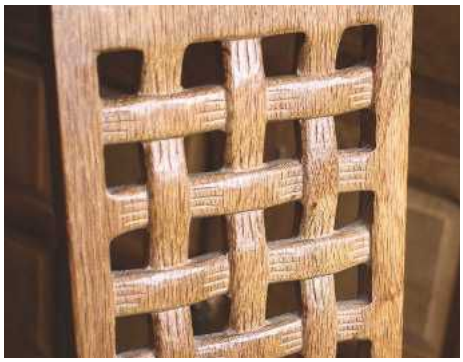
...for none of these makers is very far from the legendary Mouseman whose descendants are still carving mice onto their furniture, see p55.

Industrious beaver

With no time to see all nine I creature-picked, first dropping in on Beaver Furniture – yes, you've guessed their trademark. Established in 1960, the company is now owned and run by Lesley and David Glegg, daughter and son-in-law of the founder, Colin Almack.

David was taught to make by Colin. Each piece bears a carved beaver and over the years commissions have been received from London's Southwark Cathedral – resulting in Colin and David being presented to the Queen – Eton and Ampleforth Colleges, Beverley Minster and Chelsea FC's Roman Abramovich. Last year a Yorkshire rose clock was carved to commemorate the Yorkshire Grand Depart of the Tour de France.

Production is brisk and crisp



This latticework back is typical of the North Yorkshire vernacular

Busman's holiday

This is the work of a real beaver

Nice placement on a foot

The number denotes the year this timber was felled, milled and put in stick

Carving a beaver is painstaking work
Photograph by Beaver Furniture

The beaver motif sits neatly into a leg
Photograph by Beaver Furniture

Coat of arms carved at Beaver Furniture
Photograph by Beaver Furniture

Each piece of furniture is made from sustainably sourced English oak and customers are encouraged to select specific boards. Clients are also given the option of having panels and tops adze-d to create a honeycombed effect on the wood. The pieces are handmade using traditional techniques.

David mills the wood on site and a large open shed opposite the gallery, workshop and mill is stacked with timber in stick, marked with the year in which it was felled. "We specialise in drying wood ourselves, although," he cautions, "where there is going to be underfloor heating it needs kiln drying."

He adds: "We've just bought 60 tons of timber from an estate in Northumberland and will leave it a year an inch to dry. We don't need any more thickness than 4in.

"We're always looking for sustainable wood that's felled under licence and only buy the best quality. A big tree will be billed cut (down the middle) then sliced. We need wood that will curve and bend easier for curved cupboards."

Showing us a huge slab of burr, he says he is saving it for a dining table. "It would be criminal to cut it up."

You understand how he reveres trees when he recalls that when his father-in-law died 19 years ago the family began planting a tree for every piece that was made.

The white rose of Yorkshire, here carved at Beavers, is one of several common themes on the trail
Photograph by Beaver Furniture

Gallery

Visitors enter the premises through an attractively stocked gallery which leads on to surely the lightest and airiest workshop I have ever seen, where seven full-timers and two part-timers make, according to David, "anything. We're a flexible group of chaps," a statement he proves by showing me the chair, main image, whose elaborate back and beaver emblem on an arm was carved by Peter Stout

Squirrels show the provenance of these stools

It's squirrel o'clock

Geoffrey Gell at his bench

The sign of the unicorn

Here it is tucked on the underside of a table

who also does the upholstery, and a coffee table, made by the company in the 1960s with an adze'd top, that has come in for refinishing.

Why the beaver motif? Well, it's obvious: "We're busy as beavers," he says, showing me a stump that has been neatly gnawed by one of these animals. "The beaver is the most industrious animal in the wood."

The beavers may be found in obscure places, like on a desk slide, the desk being made for a home office to take a wireless printer, laptop and keypad. The company's preferred finish is to fume in ammonia and then apply a wax polish – the smell of which deliciously permeates the buildings.

Success is very much down to the hard lessons learnt from David's father-in-law. "He was good at his job and very strict with us. With that much experience we were lucky and learnt from him."

Squirrels & swans

In the hill village of Husthwaite is Squirrel Woodcarvers. This company was established in 1957 by Wilfred Hutchinson, who died two years ago, and is now run by his son Trevor whose handmade dining furniture, coffee tables and small articles are all made from English oak and carry their squirrel symbol.

Trevor is a walking encyclopedia of Mouseman heritage. His dad was one of Mouse creator Robert Thompson's apprentices and it seems that when these men broke away to run their own workshops they carved their own symbols, Wilf choosing the squirrel.

Trevor too was apprenticed. "We had some fine tutors, like Stan Dodds, who was Woodpecker man; he taught us a fair bit and had worked with Mouseman in the 1950s.

Another apprentice, he says, was Martin Dutton, whose motif was a lizard. "He worked at Mouseman's in the 1940s and '50s and was deaf and dumb. Then there was Malcolm Pipes. He was Foxman."

Nestling at the foot of the Hambleton Hills, in Bagby, Graham Duncalf has chosen a swan as his motif. He handmakes in English and American hardwoods sourced sustainably, all the work being undertaken by himself, starting from the tree butt to the finished piece using traditional techniques. And then there was Wrenman, another Mouseman apprentice...

The unicorn isn't immediately obvious on this sink unit but just look at those quilted maple doors stacked up

David Hunter gives close attention to a top

The mouse motif

Robert (Mouseman) Thompson (1876-1955), famous for carving a mouse on almost every piece of oak furniture he made, had a typically Yorkshire sense of humour and it is said that the motif came about in 1919 after a conversation about being "as poor as a church mouse" between Thompson and a colleague while they were carving a cornice for a screen. He carved a mouse on it and went on to carve one on each piece of subsequent work.

Thompson lived in Kilburn and was part of the 1920s' revival of craftsmanship inspired by the Arts & Crafts movement. Today his descendants run the workshop and the company is known as Robert Thompson's Craftsmen Ltd – The Mouseman of Kilburn. And they still carve mice on their pieces. Some of Robert Thompson's original work can be seen at the visitor centre, which contains rooms set in the 1930s that are full of furniture that he made himself. Most of nearby Ampleforth College's houses are furnished with his work.

For more info go to www.robertthompsons.co.uk

Robert Thompson carves his signature mouse

A mouse is still carved on furniture

Photographs by Robert Thompson's Craftsmen

Busman's holiday

Bold wrens

...Wren Cabinetmakers is situated in the picturesque village of Thirlby where Bob Hunter has lived all his life. With the exception of a few basic machines, all the work is done by hand, including the use of an adze on all top surfaces, and every finished piece bears the trademark of a hand-carved wren.

All this family business's output is produced by Bob, his daughter Jackie – one of only a few female woodcarvers in the trade – his two sons David and Gary who are both skilled cabinetmakers, and his grandson Jack.

By why carve a wren? Says Bob: "When I moved over here to the farmhouse I had a lot of renovations to do. The building was open to the elements and we lived in a caravan. My daughter saw a wren on a piece of furniture. Even today one bold bird builds its nest behind a saw blade hanging on the wall and raises its young." Bob says that the wrens seemed to be presiding over their activities like a lucky emblem so they decided to carry on the good work in wooden form on all their products. And these include everything from napkin rings to church work, with the adze used on top surfaces.

Spot the wren on the letter rack

Bob Hunter carves a wren

Now in his 80s, Bob is supposed to be retired but is still working, helping David and Jack in the furniture workshop and Gary with his joinery in an adjoining workshop.

Unicorn

Coxwold Cabinet Makers was established in 1987 by two local lads, Geoffrey Gell and Jonathan Dixon, with the help of a £1000 grant from The Prince's Trust. In 1988 as the business grew, they employed Paul Cooper who had recently finished his apprenticeship. Specialist commissions include shop fitting the visitor centre on the Duke of Devonshire's estate at Bolton Abbey and a library at Husthwaite School.

In 2008 Jonathan Dixon left the partnership and after 20 years of service Paul Cooper became Geoff's new business partner.

They undertake commissions in all types of wood and specialist veneers and take on work from solid wood kitchens to CD racks, all marked with a unicorn's head. Says Geoff: "The local landowners have unicorns on their coats of arms so we went with that."

All their work is bespoke and not necessarily in oak. "We tend to get more of the specialist pieces," he says, showing us an English yew circular side table with the unicorn motif sitting underneath. "We have a tendency to hide the unicorn now. We've tried to do things a bit differently."

Next month: the road trip goes to York to meet makers Jacob Pugh and Luke Caley

On the road

The Thirsk Furniture Trail, sponsored by Duffield Timber, is set in and around the North Yorkshire town, an area rich in cabinetmaking. It involves a bit of back doubling but who cares when the scenery is so delightful.

Abandoning my quest for animal motifs I just had time to look up Design in Wood whose pieces contrast excitingly with more traditional ideas. Here I found Richard Burnley who took over the company in 1993 after working with its founder since 1989. Richard worked in London as an architect for 10 years before becoming a furniture designer and maker and moving to Yorkshire.

Paul Steel started making furniture and doing joinery in Ottley, Yorkshire in 1983 and has worked at Design in Wood since 1991, bringing a wide experience of traditional and modern cabinetmaking techniques and architectural joinery to the business. Richard says: "All our furniture is handmade, primarily from temperate hardwoods, with other materials such as metals, stone, plastics and leather serving to complement the wood.

One of the biggest companies is Treske, which makes a wide range of bespoke and standard design freestanding and fitted hardwood and holds a Worshipful Company of Furniture Makers guild mark for manufacturing.

Two miles from this lovely town, at Carlton Miniott, lies Carthouse Furniture, formed in 1995 and relocated in 2003, with a showroom situated in a former carthouse and granary.

Lastly, at Old Mill Furniture in Balk, the Knight family and their team of craftsmen are making furniture in traditional and contemporary styles in a variety of UK, European and US hardwoods.

Where to find them

For information on each maker and driving instructions go to www.thirskfurnituretrail.co.uk

Beaver Furniture
Beaver Lodge, Sutton-under-Whitestonecliff, Thirsk, YO7 2PR
www.beaverfurniture.co.uk

Carthouse Furniture
Glebe Farm, Carlton Miniott, Thirsk, North Yorkshire, YO7 4
www.carthousefurniture.co.uk

Coxwold Cabinetmakers
The Old Farmhouse
Workshop, Coxwold, York, YO61 4AA
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Readers' holiday discoveries
If you have visited any makers on your trips abroad and in the UK please tell us about it. And we'd like to see your pictures too!

This month arborealist **David Vickers** and *GW's* **Andrea Hargreaves** gang up on Hannah Dowding who gamely agrees to take on our challenge to adapt her techniques to make a table in green oak

Green experiment

When we left David Vickers last month he had just milled planks from a windblown English oak that some of his students had dealt with last year. When I next caught up with David he was delivering two very choice boards to Hannah Dowding who was exhibiting her eye-catching coffee and

Hannah Dowding and David Vickers with some of Hannah's work made with fully seasoned timber

Hannah has cut the dovetails to allow plenty of movement

side tables along with ornamental wall boards, candle holders and other decorative items at a craft fair in Farnham, Surrey.

It was sixish on a damp Tuesday evening just before Christmas. The transaction took place in a crowded car park and it was so dark that Hannah had to take it on trust that the 8ft x 15 x 1½in boards would do the job.

David recalled: "The timber came down in the winds of February '14 and had sat down in the coppice for nearly a year. It was milled last weekend and put in the garage. It will have been down for close on a year so it won't be fully dry. There will be some movement in it."

All of which poses problems for Hannah whose all hand tool technique is honed for properly seasoned timber.

Hannah, who has what she describes as a small workshop in Folkestone, Kent, likes to do rustic pieces. Those on display at the craft fair are typical, with dovetailed joints, waney edges and her signature piercings.

Answering challenge

How did she feel about the challenge? "I generally use seasoned wood so it will be good to see the difference."

She would be planing down one board to 19 or 20mm thickness so that she could cut her leaf design into it and was ready for some meaningful preparation. This would include going to a friend with a bigger workshop and machines to get the wood planed and finished.

"I always make tangentially where the grain wraps around, and take the design around," she says. "Then I get handsawing and chiselling the dovetails before gluing it together. These dovetails won't be so precise and will allow natural movement."

Hannah, who gained a degree in furniture design from Nottingham Trent university in 2000, has been working "more than part time" for the past three or four years. "My aim is to have my own workshop in Folkestone."

Currently she sells regularly at Greenwich Market, London and at craft shows including this one, Festival Crafts, at The Maltings, Contemporary Crafts at Bovey Tracey, Devon and the Great Northern Craft Show in Manchester. She sells side tables from £265 and coffee tables from £395, along with affordable items such as leaf stem cutout trays and coasters, clocks with bird designs, tea light holders and wall-mounted vases, in oak, ash and walnut.

Contacts

David Vickers runs Drivelink Training in Hampshire
www.drivelinktraining.co.uk
Hannah Dowding's workship is in Folkestone
www.hannahdowdingfurniture.co.uk

Hannah's observations

"I had to appreciate the natural curve/roll and constant movement of the timber and accept that the table may not be truly square and joints may not be totally tight which was a challenge as I pride myself on perfecting tight-fitting dovetail joints.

Oak was more prone to splitting and cracking and it therefore made it difficult to clamp and brace.

Chiselling of the dovetail joints was more challenging due to the high moisture content of the green oak.

I also had to accept that once the table was completed that it will continue to move and dry out and it may affect the tightness of the dovetail joints and overall flatness and appearance of the table but this aspect should be embraced."

The crisp piercing contrasts attractively with the burr oak

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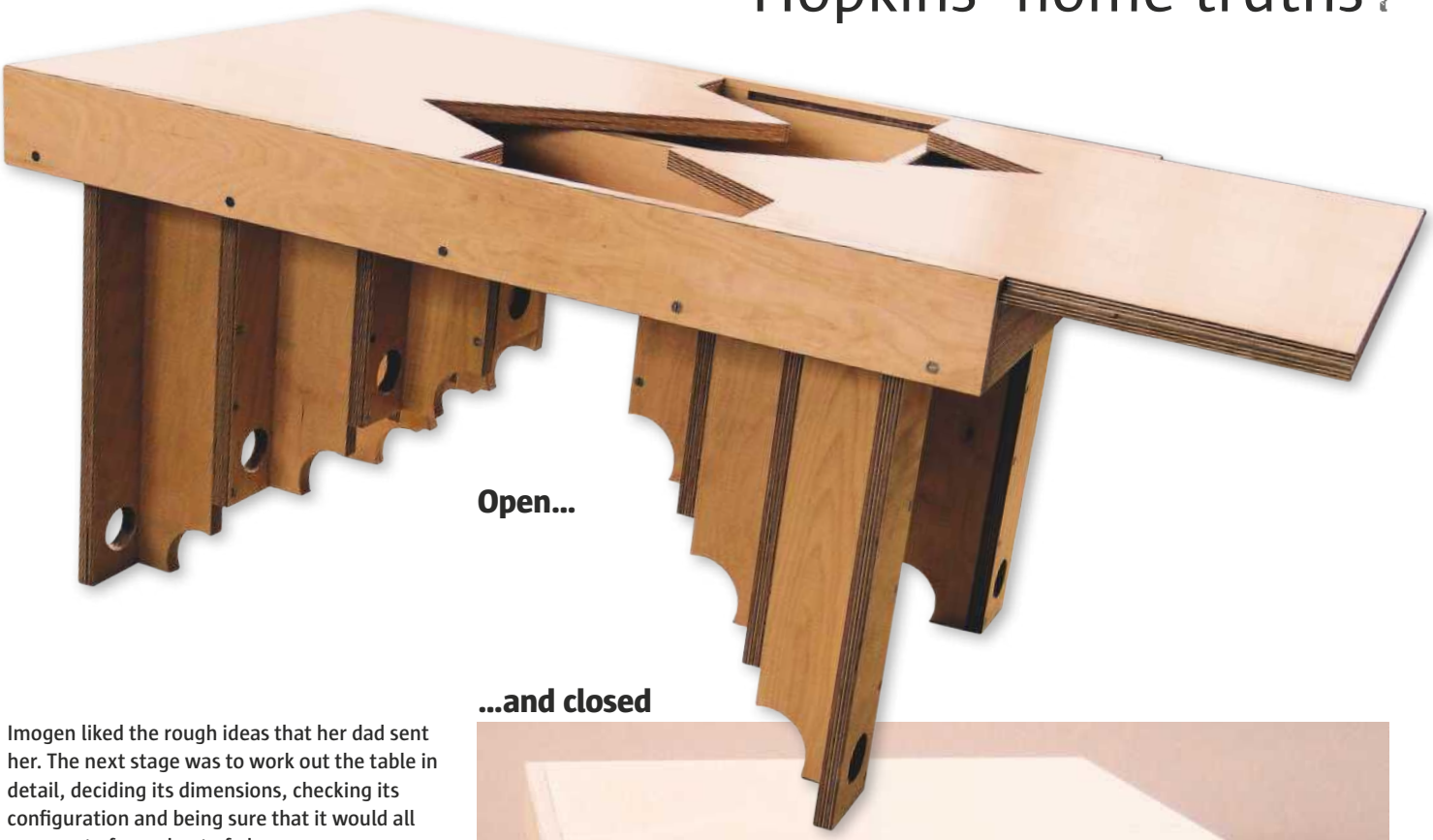
My daughter's table

This month **Edward Hopkins** takes a break from his garage to help his daughter make the coffee table designed in *GW*288



Open...

...and closed

Imogen liked the rough ideas that her dad sent her. The next stage was to work out the table in detail, deciding its dimensions, checking its configuration and being sure that it would all come out of one sheet of ply

Imogen and I assembled the table in one day. Most of the work was in the leg structure, and I think we must have worked quite hard because about mid-afternoon we lost the plot. We were trying to be methodical about which sides of the leg were drilled and countersunk when it was as if a mist of misunderstanding drifted in, and each of us stared gormlessly at a component, turning it this way and that as if we'd never seen it before. The mist cleared and by the end of the day we could walk around the table, seeing it for the first time in three dimensions. I've always found this one of the most exciting stages of furniture-making, and now Imogen knows it too.

We could have ploughed on the next day, but by then a few tricky issues had occurred and I felt the need to approach them at my own speed.

Screw problem

When I came to final screwing, I found that the stainless steel screws were gripped by the ply so definitely that I was not free to line up their slots, though most I managed to set either horizontally or vertically. I think if I wanted to do this again, I would start every screw in its pilot hole with the slot at a particular angle so that it came to rest where I wanted it to. Oh dear! Perhaps I should get out more.

I spent time wondering how to stop the flaps pulling all the way out without any protrusion into the compartment – which might foul its contents. A groove underneath could locate in a lug screwed to the inside of the case but I foresaw accessibility and accuracy problems. I became completely stuck until, moving the flaps in and out, I realised that it was no more likely that a user would accidentally pull the flaps right off the table than she would be to pull a drawer fully out of a carcass. It is conceivable that a curious and dextrous toddler could make that mistake. If needs be, I'll don my thinking cap again.

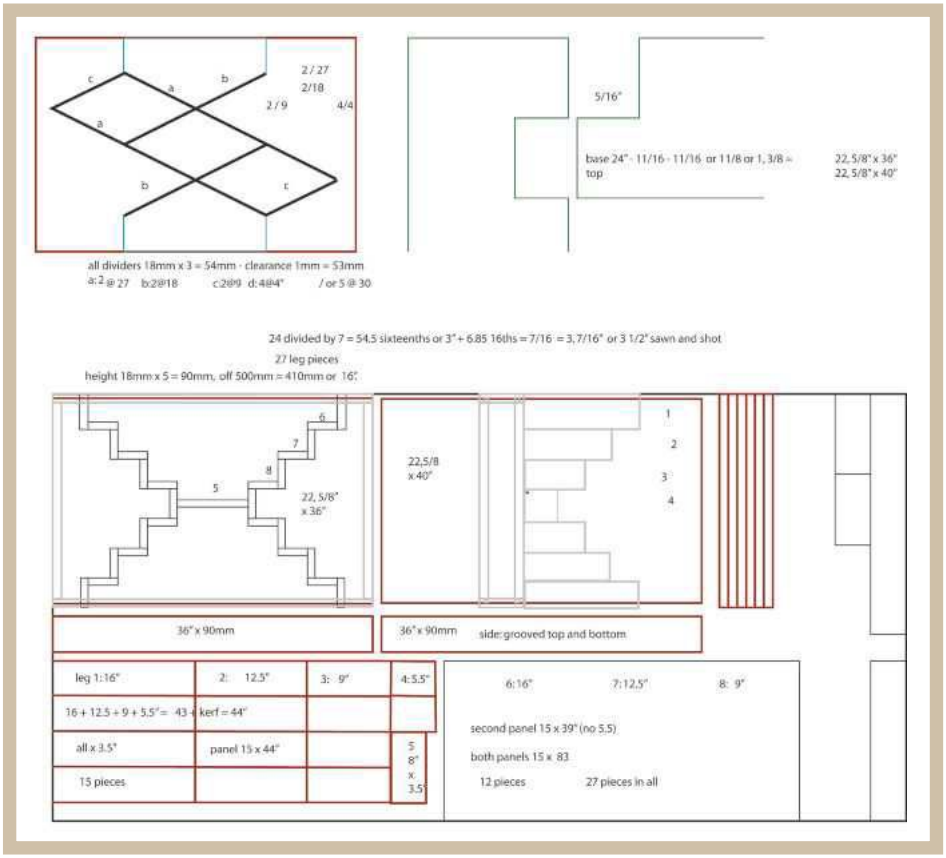
To stop the flaps in the middle, I cut the tongues back by an inch and glued a block of wood into the groove.

Compartment dividers

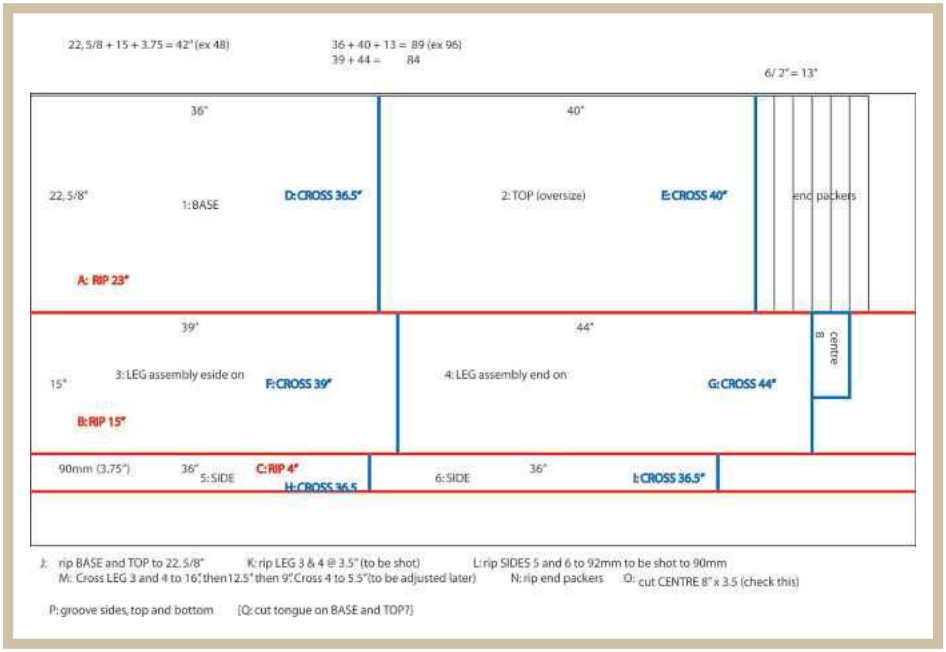
I gave up on the compartment dividers being angular and zappy because something had gone astray in the plotting of my zigzag, and a simple shape was not on offer. Not that it would have been simple anyway to mitre so many dividers and fit them together seamlessly. I told myself that the compartment had to be able to take A4 documents and that practicality here outweighed style.

There has been slippage. The outside edges of the flaps are slightly out of line with the table ends and will have to be planed down. This disappoints me. It won't be noticeable when the table is sanded and sealed, but it should not have happened. Now that it has happened, I should know why, but just at the moment it is completely beyond me.

How the table was made



▲ Pic.1 **The cutting list**



▲ Pic.2 **A cutting diagram for one 8 x 4ft sheet of 18mm birch ply. Components are slightly over size to allow for a second, yet more precise cut. The red lines are first ripping cuts, the blue lines first cross cuts. It took four times as long to produce this diagram as it did to saw the pieces but that is the point: Edward wants to know exactly what he's doing and what the sawyer will be doing. He's grown up with feet and inches. Now metres and millimetres have taken over but Ihe's clinging on regardless. Here he's using both. "Worse than that, I'm having to use horrible amalgams like '3.75 in' because it is too fiddly to write ¾ (let alone 15⁄16) on the computer. It's not to be recommended, but I know what I mean"**

▲ Pic.3 **You'll notice that Richard works with saw guards removed and you might reach for a pen. It worried me too in the beginning: I'm used to it now. Richard is fully familiar with working this way and is well aware of personal safety. Like this he can see clearly what the blade is doing. Perhaps he is more in control. But for anyone less experienced than Richard, this might be hazardous and is not to be tried at home. Good dust extraction keeps the air clear**

▲ Pic.4 **Richard has built a cradle with which to cross-cut sheet material as accurately as he rips it. It runs in the guide slots of the table saw. It would not work if the saw blade were guarded. The cradle provides firm holding for the sheet. Keeping the workpiece under tight control is of prime consideration in safe woodworking**

▲ Pic.5 **Richard has extended his saw table so that he can rip an 8 x 4ft sheet single-handedly. Imogen is largely unnecessary here but she witnessed the very beginning of her coffee table, and loved it**

▲ Pic.6 Edward asked Richard if he would groove the table sides, the base and the top. "Nine mil any good?" he asked. His spindle moulder was set up to cut 9mm and it took seconds to adjust it and test it. Richard is deadly accurate. It's a powerful, and in his hands, precise machine. When he'd finished the top, he lowered the blade and took an extra sliver off so that the tongue would slide easily in the grooved sides. A second cut wouldl take the whisper of wood remaining on this rebate

▲ Pic.7 Quality ply is a great material: strong, stable, uniform and decorative. A stack of components precisely cut is anticipation embodied. But notice scorch marks: some seemed inevitable and had to be accepted. Furniture made of ply is only ever that and on the grand scale will not be 'fine'

▲ Pic.8 How to cut the zigzag top? "I considered clamping a fence parallel to each line and cutting to it with a handheld router. It would have worked, but would have taken all afternoon and been a nervous operation. Instead I took the opportunity to try out a CNC (Computer Numerical Control) cutting service. Next time I'll want to take my own file on a memory stick, but this time the operator converted my drawing for me. As with sawing up the sheet, precise measurements are essential. The machine passed and re-passed, working to a tolerance of 50 microns (2 thou) which is rather better than I would have managed on that nervous afternoon. Only for the sake of the photograph is the dust extractor hood disconnected.

Cody Marchant runs Wooden Wood Ltd (www.devonoakproducrs.co.uk). His father, in the unit next door, develops and manufactures the CNC machines and sells them Europe-wide. The machine is versatile, working not just in the X and Y axes, but up and down in Z as well. The lettering that Cody specialises in is superbly executed as the cutter sweeps up to make serifs and tails

▲ Pic.9 How to cut the quadrants on the leg components? Richard uses something like this to good effect but Edward was apprehensive and rightly so. "Maybe my drill spins too fast. No matter how hard I wrenched off the grub screws, vibration worked them loose. As it whirled round the tool became terrifying, threatening at any moment to fly free and disembowel us. I think I might hide it"

▲ Pic.10 A hole saw is gentler. The largest cutter wasn't large enough so it was set in a little, making the cut wider than a quadrant. This had the advantage of the central drill bit locating firmly in the ply rather than trying to hover on a corner. This cut was all but perfect. With a smaller cutter, Edward sawed the holes in the other leg components. Here, because the waste was not so readily ejected, the saw tended to scorch

▲ Pic.11 Most of the drilling was in a press against stops. When setting stops, the waste is allowed to escape rather than collect in a corner and give a false position. "I should have bought new bits. Sometimes the pilot drill must have skated off ever so slightly because not all the assemblies were as true as I'd have liked"

▲ Pic.12 Piloting by hand: Imogen is watching the bubble on the drill so as to hold it horizontally. "Here we screwed not into the middle of the ply but into the middle of the tongue, so accuracy was important. Working on a breakfast table is far from ideal"

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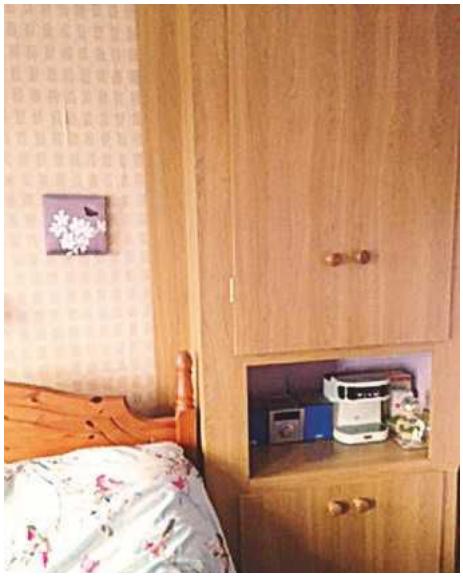
LETTER OF THE MONTH

John Mullins solved some difficult problems with this project



The right-hand wardrobe

The hinge fixing

Wardrobe solutions

My daughter, who lives in the left side of a semi-detached Victorian house, asked me if I could fit a freestanding wardrobe into the alcove on the left-hand side of the chimneybreast. To do this I would need to cut off two moulds the full height of the wardrobe and then stand it on a platform on top of the skirting. The bed headboard was against the chimneybreast and overhung 3in either side. This would push the bed further into a crowded room.

I decided I could make two built-in wardrobes that would not cost a fortune and would give her a lot more room. Oak Contiboards meant very little machining. Ten 8ft x 6in boards would be enough for the frames and 2/12in boards. Ceiling height was 8ft 5in, so I was using a top and bottom board. The uprights could be screwed behind them with a 2½in gap top and bottom. The chimney breast was only 8½in deep. The back walls were dry-lined to counteract damp.

To begin I took a size from the wall to the edge of the chimney breast. I took two 6in boards, cleaned and squared up one end then covered them with iron-on oak plastic veneer cleaned off with a sharp wide wood chisel; I ran the edges with fine sandpaper. I reduced the size I had taken by 4in to allow for the bed and cut the top and bottom boards to suit. With the frame ⅝in and return boards of 12in, ⅝in and 8½in, it gave me about 1ft 9¾in to the back of the bottom board which I placed on the carpet parallel to the back wall. I levelled it using packing where needed, then scribed over the skirting to the wall. Holding an upright to the wall I plumbed it. If it was tight at the skirting I cut a 2½in-long notch over the skirting, no scribe needed. If it was tight at the top I put a mark on the top of the bottom board, 6in and any gap. Using an upright as a rod I held it tight to the ceiling at the wall end and marked on it the top of the bottom board and the same to the other end and annotated the smallest size. I marked a line 2½in down from each end of the two uprights and on the edges.

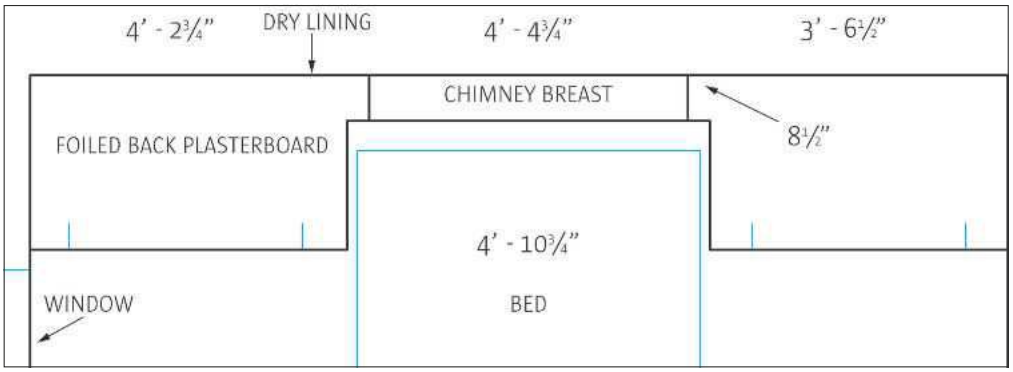
Bed as bench!

Then I drilled three random screw holes in each. I laid the uprights across the bed – covered – that I was using as my bench and placed the bottom board under the uprights to the edge marks using the notch cutout as a pattern for the overhang, then G-cramped them together and put in a screw. I then cramped the wall side to the edge of the upright if there was no gap, or to the line 6in plus gap if there was, and put in a screw. I did the same to the top board with the overhang but using the size I wrote down from the top of the bottom board to the top of the top board.

I cramped and put in one screw the same on the wall side, same height but the width using the size at the bottom of the door opening. I squared the frame up then put in all the other screws. While it was in position on the bed I fixed the 12in board on the back of the upright

WRITE & WIN!

We always love hearing about your projects, ideas, hints and tips, and/or like to receive feedback about *GW*'s features, so do drop us a line – you never know, you might win our great Letter of the Month prize, currently a Trend Easyscribe, worth £29.99 inc VAT. Write to the address on the left for a chance to enhance your marking capability with this versatile workshop aid.



edge with knockdown corner fixings. I cramped an offcut of wood on the upside of the 12in board, top and bottom, sticking up with the screw of the cramp this side. I placed the 6in return board up to the offcuts on the edge of the 12in board and packed up off the screw of the cramps to hold it in position, then positioned the 6in board 2½in up from the 12in board to ceiling height. I drilled a pilot hole top and bottom through the board into the middle of the edge a little more than the screw length and fixed, then repeated with two or three more screws.


The right-hand wardrobe

I then screwed three fixing blocks to the inside of the top of the top board and to the inside of the bottom of the bottom board. After dismantling the 12in board with the 6in return board still fixed, I lifted the frame into position tight to the left-hand wall then refixed the 12in board with 6in return board sitting on the skirting board around the chimneybreast and on its face approximately 2in. I plumbed the front of the frame at the chimneybreast in case it wasn't upright and screwed through the fixing block into the carpet and floor without pressure.

I then fixed into the ceiling through lathe and plaster, parallelling off the back wall to the top of the bottom board at the wall end and screwed to the floor, then laid a straightedge along the middle of the bottom and top boards and screwed the middle fixing block without pressure to prevent warping.

Plasterboard precaution

Because of the damp I covered the front corner wall inside the wardrobe with ½in foil-backed plasterboard fixed with silicon and ran silicon down the edge where it joined the back wall. The top shelf and hanging rail were carried by 3 x 1in PAR silicon to the back wall and screwed into the spot fixings of the dry linings and the front one screwed to the back of the uprights. The two ends were fixed with corner blocks. The shelf was ⅜in MDF. The front edge was covered by a 6in board between the uprights screwed to the 3 x 1in bearer.

I planed square one end of the 8ft x 18in doors along the top then checked the tops for square. I marked a line for the length of the doors 3/16in short of the tight size before cutting and cleaning up the edges. After putting them together again to check I edged with veneer before fixing three 3in flat hinges to the back of each door 6in down and one in the middle, standing one door on the bottom board 1/16in short of the centre line and marking the back of the door on the upright above and below the hinges.

I measured the edge of the loose flap to the back of the door then put those marks on the upright in line with the hinges. Holding the open door with the bottom edge sitting on ⅛in packing on the bottom board, I opened the loose flaps tight against the upright and put to the mark, marking one hole in each hinge. I drilled a pilot hole to the marks then, holding the door, screwed the middle hinge then the top and bottom. I put the doors together and used the other screws to adjust the doors if needed.

John Mullins, by email

Thanks for that John. I think readers nervous of tackling an awkward job will welcome your solutions and I'm sure your daughter is delighted.
Andrea Hargreaves

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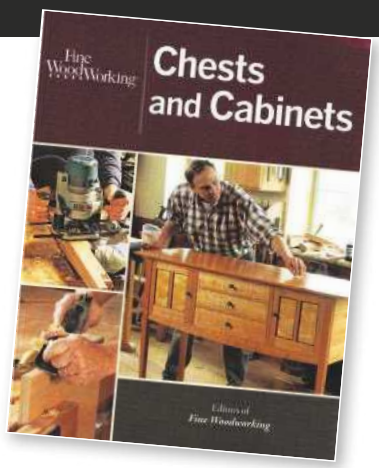
Around the House with Phil Davy

It's more than a decade since I've had to buy logs for the woodburner, so it came as a surprise when I needed to supplement my dwindling supply before Christmas. With oil prices falling, it's a pity the same can't be said about firewood. A friend tipped me off about a local sawmill specialising in oak, with offcuts in suitable chunks for the fire. Sold on a cash & carry basis, it was economical to rent a van to obtain several loads. Even better, a forklift loaded the jumbo bags straight into the back of the vehicle. Not so easy unloading the logs back at home with a wheelbarrow though...

Phil Davy, Consultant Editor

Book review

Chests & Cabinets



Like many *Fine Woodworking* books, *Chests & Cabinets* is a compilation of projects and features from back issues, with the emphasis on good design and technique, clear instruction, plus excellent photography and artwork. As such, there's no logical progression here as each item of furniture stands alone. Nothing wrong with that, though perhaps some sort of skill level rating would have been helpful. The delightful Arts & Crafts bookcase and vanity cabinet are obviously less challenging for the woodworker than the traditional Queen Anne lowboy, for example, but other items are less easy to assess in terms of difficulty.

Built mostly from solid hardwoods, there's an undeniable sense of quality here.

The choice of timbers helps, including some gorgeous figured oak and cherry. You could spend a fortune trying to replicate some of the materials but they provide inspiration. Some projects demand a large workshop but others are relatively compact.

Although drawings are included there are no cutting lists, which is disappointing. Some techniques shown are scary – and impossible – this side of the Atlantic, such as cove cutting with a dado head on the table saw. In summary, fine furniture projects from top craftsmen, aimed predominantly at the advanced woodworker.

★★★★☆

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Q&A

Biscuits or pocket screws?

Q Although relatively new to woodwork, I have some tools and hope to revisit those skills I remember attempting in the school workshop. I'm keen to build some basic furniture from mostly sheet materials, but what is the best method of jointing these? Should I buy a biscuit jointer or would a pocket-hole jig be a better choice? I'll probably be cutting timber with a portable circular saw.
Pete Fraser, via email

A *Both jointing methods are ideal for sheet materials plus solid timber. Both are strong and rely on butt joints, so panels are straightforward to cut with circular saw and guide fence. The advantage of biscuits is that they're hidden once pieces are glued together. You'll need cramps while gluing but joints cannot be taken apart once it has dried.*

Pocket-hole screws rely on a jig and drill. Cramps are not usually necessary, apart from the face cramp supplied with the jig. Pocket screws are fast to use and you don't need glue, though this does increase strength. The real benefit is that screws can be removed, so the method is ideal for making jigs or temporary construction work. Pockets may be visible in some situations, though these can be concealed with wood or plastic plugs. Angled joints are generally easier to make than with biscuits.

A basic pocket-hole jig such as Trend's or Kreg's will be much cheaper than a decent biscuit jointer. I'd avoid a cheap jointer as there can be too much play in the fence mechanism.

Winter project

Takes: one weekend

METER CUPBOARD

Tools you'll need

circular saw, jigsaw, router, sander, drill

Made up job

When **Phil Davy** set out to make a meter cupboard in his old cottage he found nothing was square

Part of the ongoing renovation work on my cottage includes improving essential services such as the electrics. Although the building had been rewired some years ago, the consumer unit alongside the meter was woefully inadequate. A separate feed was needed for the workshop, plus an increase in the number of 13A sockets demanded more miniature circuit breakers. Obviously properties some 200 years ago would not have had a power supply when built, so when electricity finally reached our humble homes up and down the country it must have been a revelation. Of course, we now find it impossible to live without it, though the occasional power cut can be an adventure, if not rather inconvenient.

Sturdy stonework

The existing meter and consumer unit had been mounted in a cupboard built into the stonework. With walls about 500mm thick, it would not have been too difficult to remove enough stone to accommodate the carcase, adding a pair of doors on the front to hide the electrics from view. My new consumer unit is considerably longer than the previous one, which meant that space was pretty tight inside the existing cupboard. As the old cupboard was in a corner, my electrician suggested mounting the new unit at 90° to the meter. This meant there was no need to remove more stonework and I could conceal the electrics by building on to the front of the old cupboard. In an ideal world I would have removed this and built a larger one, but it would have meant complications with the power supply to the house, not to mention major disruption and replastering.

Any project such as this depends on the individual situation, and it's generally a case of making it up as you go along. Walls are rarely square or plumb, so scribing tools and sliding bevel are essential items. To get an idea of what could work, I made a couple of cardboard templates, transferring dimensions to 6mm MDF. There were some awkward angles and exposed ceiling joists to cope with, so making mock ups was worthwhile.

As most of the joinery in the cottage is from oak, I chose to use 19mm veneered MDF for the carcase and doors. This needed lipping on exposed edges, so I planed up strips of solid oak to finish at about 21 x 12mm. Rather than mitre the lipping around both doors, this was cut flush on horizontal edges before gluing vertical pieces. This gave uninterrupted long edges and made doors easier to plane when fitting.

I used iron-on edging at the ends of vertical cupboard panels, though this is not as durable as solid wood. Although iron-on lipping is quick and easy, it's not recommended for edges of doors where hinges are to be fitted. Thinner MDF was used to conceal unsightly wiring between the old cupboard and ceiling above.

On reflection

This was quite a fiddly project and in hindsight it would perhaps have been easier to make a face frame for the doors, biscuit-jointing this to the new carcase. Traditional brass butt hinges and oak knobs were straightforward to fit, with a coat of Chestnut Hard Wax Oil completing the job.

1 The old meter cupboard is set into stonework and leaves no space for new consumer unit

2 Mark height of battens for consumer unit. Drill wall and screw in place, checking for level

3 Check position of replacement unit. This must be connected up by a qualified electrician

4 Experiment with cardboard templates and MDF offcuts to check angles and aesthetics

5 Mark veneered MDF sheet and cut pieces to size. Stick masking tape across grain when sawing

6 Notch around ceiling joists and any obstructions, removing waste material with jigsaw

7 Bottom panel is fixed to existing cupboard carcase with batten. Screw and glue to MDF

8 Fix bottom panel temporarily and mark angle of door opening. Run saw against guide batten

9 Where edges need bevelling, first cut with saw baseplate tilted, then finish with bench plane

10 Glue lipping to MDF with cramps or panel pins. Drill pilot holes at ends to prevent splitting

11 When glue has dried, carefully remove pins and plane lipping flush. This edge is bevelled

12 Exposed MDF edges can be concealed with iron-on edging. Make sure iron is hot enough

Winter project

Takes: one weekend

METER CUPBOARD

13 With bottom and front panels fitted temporarily, check angle of door opening with offcut

14 Measure opening and cut MDF for doors. Plane edges and glue oak lipping to each end

15 Saw off horns, leaving ends slightly proud. Trim flush with block plane, checking for square

16 Repeat lipping process for long edges. If you don't have sash cramps, pin and glue

17 Carefully trim lipping flush with bench or block plane. Avoid damaging veneer if possible

18 One door has bevelled edge to meet panel. Cut this with tilted saw after adding lipping

19 Label doors and place in cupboard. Mark and plane edges equally until they just fit

20 Mark position of butt hinges on door edge with square. Gauge lines for width and thickness

21 Set router bit to depth of hinge flap and carefully cut recesses. Clean up ends with chisel

22 Mark centre hole of flap with awl. Drill and insert screw, then bore remaining holes

23 Mark hinge positions on cupboard panels. Place doors on thin card to provide clearance

24 It's far easier to cut hinge recesses on panels by removing them from walls. Mark and fit hinges

25 Cut MDF top panel to fit above doors. This needs to be scribed to fit sloping ceiling

26 Conceal any defects with appropriate wood filler to match oak. Allow to dry then sand

27 Mark position of oak knobs and drill for screws. These should be countersunk on reverse

28 Remove pencil marks and sand with 150-grit abrasive, finishing with 180 grit. Remove arrises

29 Apply an oil finish or similar with brush or cloth, removing excess before it's dry

30 Refit doors and knobs. Screw door stop and catches to bottom panel if required

Useful products: Briwax Beeswax and Liming Wax

Natural Creamed Beeswax

There's nothing quite like the smell of beeswax as you rub it into bare timber. For projects that don't need a particularly durable finish a traditional wax polish is perfect, though you may want to use a sealer first. As long as you've prepared surfaces well, you're almost guaranteed excellent results. As well as giving a beautiful finish to hardwoods, the finish can be repaired relatively easily and it's ideal for reviving existing furniture that has become grubby or dull. In fact, you'll probably find more Briwax products in use by antique restorers than any other. This creamed beeswax also contains linseed oils and turpentine and is great to use. And in case you didn't know, Briwax is now part of the ever-expanding Rustins group.

★★★★★

Typical price: £10.90 per 250ml
Web: www.briwax.co.uk

Liming Wax

Decorative wood finishes come and go, though liming is perhaps one of the more enduring effects, especially for ring-porous timbers such as oak and ash. Like beeswax, liming paste wax is easy to apply, though results are quite different. Although wood can be sealed first, you'll get better results using it directly on bare wood. For a bolder effect it's worth opening up the grain first with a wire brush. I tried this Briwax product on both bare and oiled veneered oak. Creating a lovely traditional finish, I reckon the effect would be quite dramatic on stained timber. Worth experimenting with, I think.

★★★★½

Typical price: £12.85 per 220ml
Web: www.briwax.co.uk

Its 18V...

Useful kit: Black & Decker Multievo 18V combi drill

Gutsy machine

You may remember Black & Decker's Evo tool tested back in *GW*249. This 14.4V drill featured interchangeable heads, so it could be used as a jigsaw or detail sander as well as a conventional drill/driver. This latest model is more powerful at 18V and comes with two 1.5Ah Li-ion batteries and charger. Unlike the 14.4V model, the Multievo is supplied with just the drill/driver head, and a range of eight additional heads as options. As well as a sander and impact driver, there's a trim saw, jigsaw, inflator, hedge trimmer (!) and even a router attachment. Who knows how effective this last attachment is, but with a top speed of 1550rpm it does seem too slow for most router bits.

The Multievo is bulky, weighing 1.65kg. Measuring 260mm from front to back, it may not be ideal when working in confined spaces such as cupboards. It's comfortable to grip, with plenty of rubber around the handle. With battery fitted it's stable enough to sit on the bench top without toppling over.

Surprisingly, there's a 10mm chuck fitted rather than a 13mm version, which you'd normally expect on an 18V combi. At least there's a hammer action function, selected by twisting the 11-position torque collar. This is clearly marked and not too stiff to turn.

Controls

Both variable-speed trigger and forward/reverse button are easy to reach, while the speed slider switch up top is nicely chunky. Speed range is from 0 to 480rpm and 1550rpm, while hammer action delivers up to 24,000 blows per minute. Maximum torque is 26Nm and a double-ended screwdriver bit is stored at the base of the handle.

You remove the chuck and gearbox head by simply depressing a locking button on top of the tool and sliding it off. Easy, and it just clicks back into place again when changing heads. Because it's detachable there's no LED worklight, which is a pity. Although not an essential feature, these days we're used to having lights on cordless screwdrivers. Without, it can make drilling or driving screws into gloomy corners a tad more frustrating.

The battery charger cable is not as durable as it could be, a common problem with 12V power supplies, though if you leave the charger in situ this shouldn't be too much trouble. You simply slide the battery into the charging dock and plug in. Charge time is pretty slow, taking between three and five hours – mine took four hours the first time. A flashing green LED indicates charge status, becoming solid green when fully charged.

...are powered by a 1.5Ah Li-ion battery, and you two of these with a charger

The control buttons are sensibly placed...

The chuck and gearbox are very easily unlocked and clicked back for head changing

Unlike the previous Evo tool we tested, the Multievo comes without the attachments. Each of these will set you back between about £30 and £40 a time. That's no bad thing, as you can buy just the drill initially before venturing into the world of accessories, which may or may not be worth purchasing.

The torque collar has 11 positions

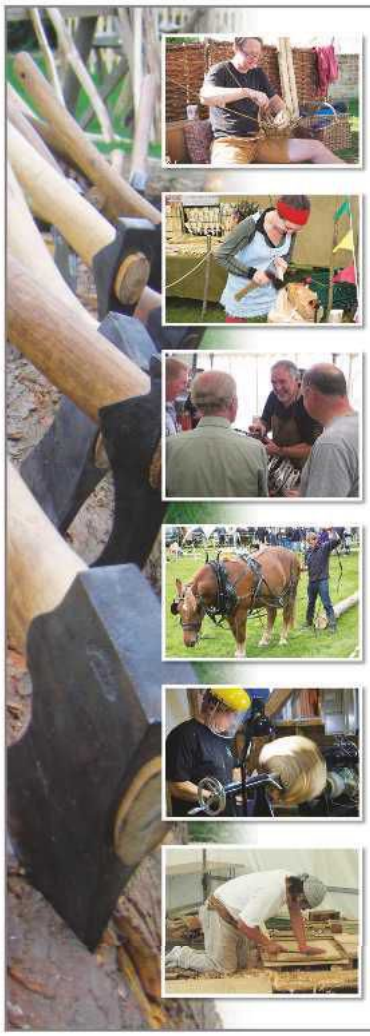
...and the speed slider switch is a good size

Conclusion

The Multievo has plenty of guts, whether drilling into timber with large-diameter flatbits or using hammer action in masonry. For what is essentially a DIY tool, though, it's very pricey when you consider the cost of some 18V professional combi drills. The attraction, of course, is the potential of having interchangeable heads, so value for money really depends on how effective these are. We'll hopefully check them out and bring you an update soon.

★★★½☆

Typical price: £149.99
Black & Decker
Made in: China
Web: www.blackanddecker.co.uk



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Let there be lights

Les Thorne turns a traditional 3-hole holder and a textured holder for a single light

It's back to basics this month with a couple of fairly easy projects for you to make. Candlesticks in all shapes and sizes are great things to try your hand at but these are for tea lights rather than candles, one in a conventional shape that utilises a really pretty piece of timber and the other a little more contemporary to make something special out of an unexciting bit of recycled wood.

As tea lights can vary slightly in size it's worth checking whether you have a drill the right size; if you don't the process will be awkward especially on the flat one. I know you can buy battery-operated tea lights but I prefer the real thing, which come with a thin metal holder that must be used as it is the protection between the wood and the candle.

I like to give all my candle holders a high-shine finish to reflect the light of the flame. You can be as creative as you like with these holders, playing about with wood, colour and texture. One thing to remember is that as you have a naked flame the holder does need to be stable so you can avoid any accidents; EN15493:2007 requires that all free-standing candles are stable at an incline of 10°, so if you're are going to sell them make up a wedge to test this out.

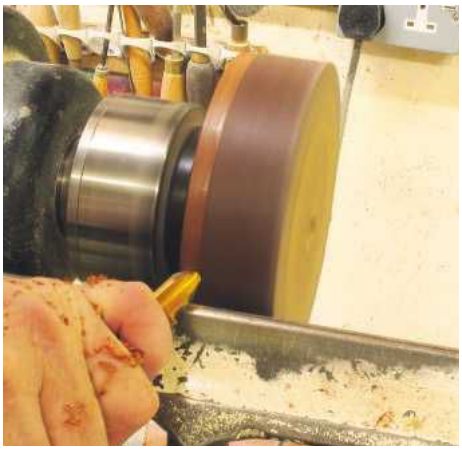
Padauk 3-candle holder

▲ Pic.1 Les chose a piece of padauk for the 3-candle one and a piece of oak newel post for the textured holder. The MDF piece was to see what sort of diameter he needed for the three tea lights

▲ Pic.2 The blank is about 150mm by 40mm. He glued it to his MDF faceplate with hot glue, opting for this method because he didn't want any holes in the top surface

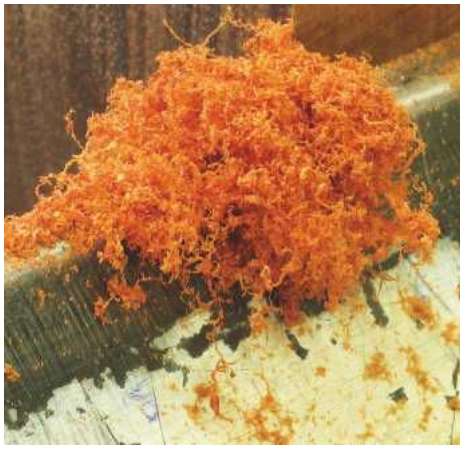
▲ Pic.3 The 10mm bowl gouge is used in a pull cut to true up the base. To keep depth of cut consistent, work from the centre out to the edge with your left hand running along the tool rest

▲ Pic.4 He has cut a shallow recess to fit the jaws on the small Charnwood chuck. On a project like this he will not bother to clean up the base at the end and may even cover it with baize

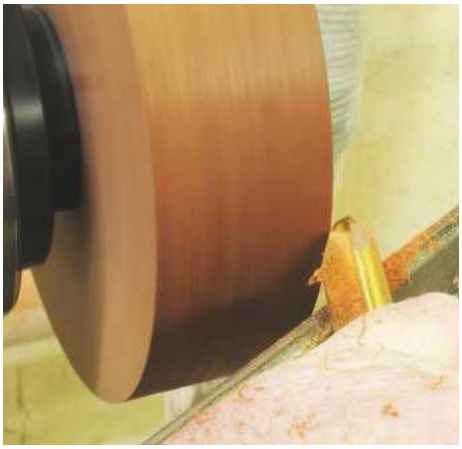


▲ Pic.5 The edge is done with the same tool but with a push cut. If you get the bevel in contact with the wood you should end up with a polished surface. Once again use your hand as a guide

▲ Pic.6 The final finish on the top is done with a scrape with the skew chisel. This tool acts as a negative-rake scraper and on a dense timber like padauk will give a great finish



▲ Pic.7 You can see the quality of the shavings: they are light and fluffy. Always aim to get smaller shavings as you get nearer to your finished surface



▲ Pic.8 You can take the arris off the edge either with the tool or, if you are not confident doing that, use a piece of abrasive. To avoid dig in if using a tool keep the flute pointing at 3 and 9 o'clock

▲ Pic.9 An oily timber like padauk can be a nightmare to sand, evidenced by this clogged piece of 120 grit. Keep using a different area on the abrasive or you will generate too much heat

Padauk 3-candle holder

▲ Pic.10 The marked circle on the top surface is the centre of the three holes. Les could have used the lathe indexing but dividers made a simple job of finding the hole positions

▲ Pic.11 He has set the stop on his drill press to give him the exact depth for the tea light. Its diameter is 38mm so he has a saw-tooth machine bit the exact size

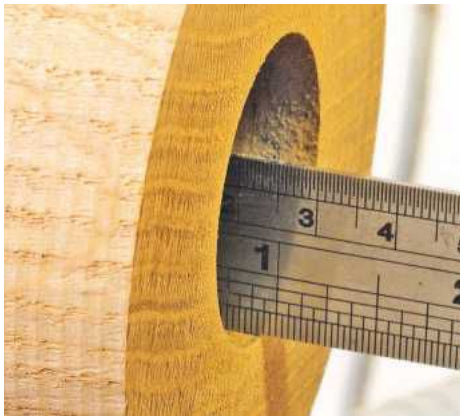
▲ Pic.12 Clamp the block to the drill table. The laser on his Jet drill press is fantastic when you are lining up where to drill. Drill slowly so you don't burn the timber

Textured oak holder

▲ Pic.1 Put the piece of 120 x 90mm square oak between centres. Rough it to round with the roughing gouge and put a spigot on, using the parting tool with the handle low to lift into the cut

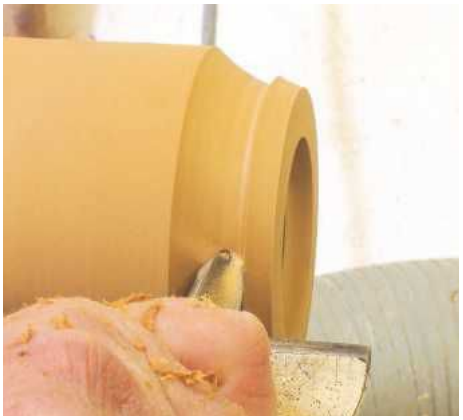
▲ Pic.2 If you are using dovetail jaws it is important to get the spigot the right size. Bow-leg callipers are perfect as the leg ends have been rounded over to stop them digging into the wood

▲ Pic.3 When you have mounted the wood in the chuck you can drill the hole for the tea light. Using a bar in the drill chuck removes any chance of it spinning in the tailstock quill



▲ Pic.4 Les has drilled to 25mm, deeper then the depth required for the candle, but he wants the light to be inside the piece. Any deeper and the candle may burn the wood

▲ Pic.5 He is opening the top of the hole 10mm wider and the same depth. This is to allow him to cut the fingers or spikey top on the candle holder



▲ Pic.6 He is starting to shape the outside of the holder with the spindle gouge. If you get any vibration put the tailstock in to support the end

▲ Pic.13 You could probably get away without sealant but he has decided to give it a light coat of acrylic sanding sealer. Don't overdo it as it will not soak in as much on less porous timber

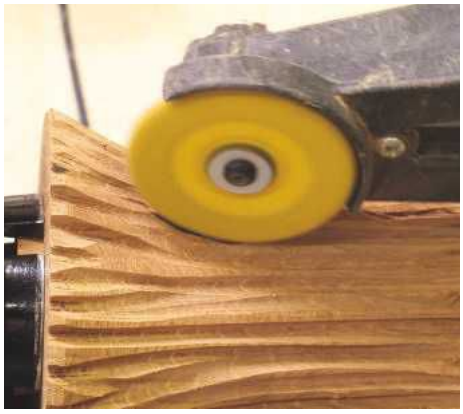
▲ Pic.14 Cut back the sealer with 0000-grade wire wool or use the Nyweb equivalent as here, which won't leave metal dust like wire wool can and is also much safer around grinders etc

▲ Pic.15 Les is using microcrystalline wax, a modern wax finish with a higher melting point than traditional paste waxes so it will withstand more handling without dulling

▲ Pic.7 Get the big guns out! The smaller Signature gouge was taking too long so Les went with the roughing gouge. Keep the flute pointing in the direction of the cut or it will dig in

▲ Pic.8 With the shaping complete Les thinks he could have got away with using a shorter piece of wood. Something to try for Mark II

▲ Pic.9 The texturing cutter is marketed by The Toolpost and developed by his good friend Stuart Mortimer. It's basically a very sharp rotary rasp



▲ Pic.10 The cutter is mounted in Les's Mini Arbortech grinder. This is the perfect tool for this job as it gives a really good finish in the grooves

▲ Pic.11 He wanted to achieve a castellation effect on the top but you do have to be a little careful not to remove the 'fingers'. You can see now why he did the cut in at the top

▲ Pic.12 The best way of removing any rough areas left after the texturing is with the blow torch but do remove any shavings or dust around the lathe

Textured oak holder

▲ Pic.13 He has given the work a light burn and is now brushing off the carbon with a liming brush. The piece should be very tactile now, looking rough but feeling smooth

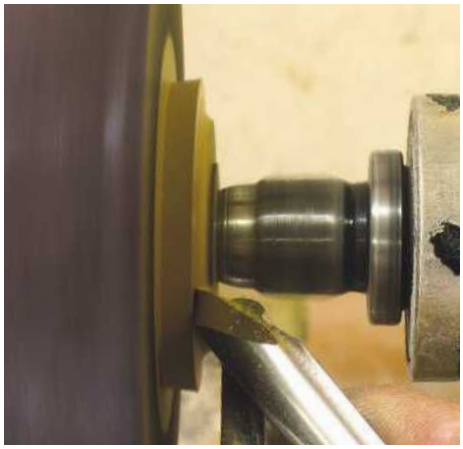
▲ Pic.14 It's looking pretty good as it is but he had already decided on the finish. Ebonising lacquer will turn the whole piece of work black

▲ Pic.15 A bright red paint should give a volcano effect and it's sort of working except the red should be on the low points – this is definite artistic licence

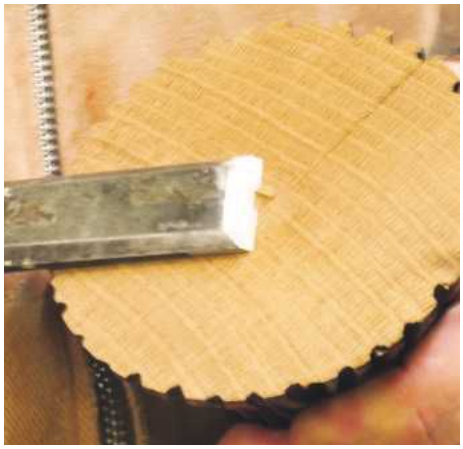
▲ Pic.16 When the red is dry give the whole thing a couple of coats of gloss lacquer. Les turned a plug for the hole in the end to act as a friction drive and allow him to turn away the spigot

▲ Pic.17 The work is mounted up between centres. You only need enough pressure from the tailstock to drive the work. The speed of the lathe should ideally be around 1000rpm

▲ Pic.18 Always use a freshly sharpened tool at this stage. Les finds the Tormek bench grinding jig is really precise and easy to use



▲ Pic.19 The spindle gouge is used for this cut, but make sure that the bevel of the tool is lined up in the direction of the cut. If the point touches the wood it will run back on you



▲ Pic.20 Cut as much of the spigot away between centres as you can. Take the piece off the lathe and remove the last bit of timber with a sharp chisel

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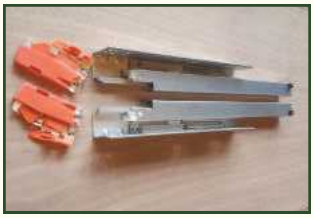


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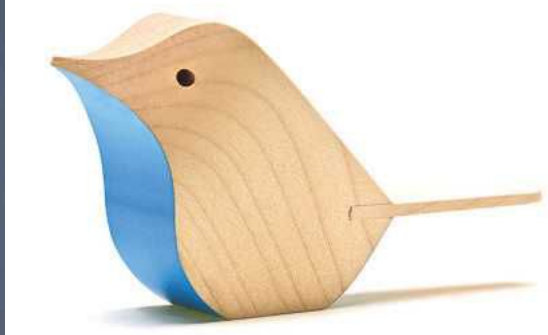
Good Woodworking

NEXT MONTH

GW291 on sale 27 MARCH



SHANGHAI-ED BY SQUARES

Kevin Stamper, who is exhibiting his work at Design Shanghai, uses the latest technology to create a representation in veneers of his original sketch. His Plum Blossom whisky cabinet and Morning Storm sideboard and mirror will be our Centrefold stars

YORK MISTERS

Customers are flocking to buy Jacob Pugh's elegant wooden birds on sale at such choice outlets as Liberty's and the V&A, but he is just as at home on cabinetry commissions; meanwhile Luke Caley is designing and making imaginative furniture from a shared workshop

MITRES & GROOVES

Michael Huntley's foundation course moves on to look at the skiils needed to be able to cut at an angle and make a recess (mitres and grooves). He shows you how to make 45° and non-standard mitres, goes on to simple dovetails and runs a groove

PLUS...

...all your favourites, with Edward Hopkins writing up his journal, your interesting observations, Dave Roberts offering his own quirky brand of woodworking wisdom, Phil Davy Around the House, turning solutions contributed by Les Thorne and Andy King's tool tests

Finishing Touch

Inscriptions

Next month **New series** Tools & fixings

The inscription authenticates this rare piece

“Sometimes one is lucky enough when rummaging through salerooms or attics to find items to which the word unique can be applied. The first item above is possibly unique, but the second certainly is. The little piece of turned timber is a ruler. These perfectly formed cylinders were made as a simple form of parallel rule. Lay it along one line and then roll it forward to a new position and provided it was made truly cylindrical then it will remain parallel to the original line wherever it stops. They are however more wishful thinking than scientific as they easily go out of true and have the annoying habit of rolling off the desk! They were good though, when used with a quill pen, because the height of the circumference above the paper prevented the inked nib from smudging the line.

So as it stands this is just a curio. But there is a little silver plaque carefully let into the ruler. It is engraved ‘Mary Rose sunk 1545 raised 1840’. This ruler is a souvenir made from Mary Rose timber found in 1840 by John Deane and William Edwards, 19th-century experimental divers. Souvenirs from wrecks were made and sold off to raise funds. This happened with all sorts of notable historic timbers.

The second picture is of a mallet, again fitted with a silver plaque. This is not just rare but unique. The inscription tells the story: ‘This mallet was used by HRH The Duke of Connaught KGetc on the occasion of Laying the Foundation Stone of the Great Dam at Assuan 12th February 1899’. As we said above, you never know what is going to turn up in the miscellaneous box in the saleroom or attic clearance. Look carefully before throwing anything away.

You may wonder why the silver is not polished and clean and shiny. The answer is that silver – and brass – polishes are abrasive and one often finds inscriptions completely rubbed away. So don’t clean it!

A little stick of wood? But zoom in close...

...and you see an inscription

Royal mallet

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The Woodworker

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